CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0028

NPDES NO. CA0081558

WASTE DISCHARGE REQUIREMENTS FOR CITY OF MANTECA, CITY OF LATHROP AND DUTRA FARMS WASTEWATER QUALITY CONTROL FACILITY SAN JOAQUIN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

BACKGROUND

1. The City of Manteca submitted a Report of Waste Discharge, dated 27 November 2001, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Wastewater Quality Control Facility (WQCF). Supplemental information to complete filing of the application was submitted on 14 March 2002, 5 September 2002, 17 October 2002, 20 May 2003, and 17 July 2003.

   The City of Manteca's WQCF accepts wastewater flows from certain areas of the City of Lathrop, therefore the City of Lathrop is named in this permit and is responsible for operation and maintenance of its wastewater collection system. The City of Manteca leases 150 acres of land from Dutra Farms (Assessor's parcel Nos. 241-320-01 and 241-320-02) for application of treated wastewater; therefore Dutra Farms is named in this permit and is responsible for the proper application and management of the wastewater on its land. The City of Manteca is solely responsible for the wastewater treatment facility. The City of Manteca, the City of Lathrop and Dutra Farms are hereafter individually and/or jointly referred to as Discharger.

2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the City of Manteca and the City of Lathrop. The WQCF is in Section 4, T2S, R6E, MDB&M, as shown on Attachment B, a part of this Order. The existing treatment plant is on property owned by the City of Manteca. Land disposal of effluent is maximized by discharging effluent at agronomic rates seasonally to existing City-owned property, and additional leased property as shown on Attachment A, a part of this Order. Excess flow of treated municipal wastewater is discharged to the San Joaquin River, a water of the United States, and part of the Sacramento-San Joaquin Delta (Delta) at the point, latitude 37^{o}, 46', 45" (deg, min, sec) and longitude 121^{o}, 18', 00" (deg, min, sec).

3. The collection system consists of two main lines servicing the City of Manteca and one line for the City of Lathrop. A separate industrial waste line has been constructed for collection of food processing waste so that it can be separately treated and disposed on land. The industrial waste

line is not in service. All waste is currently treated in the municipal treatment plant. The treatment system consists of raw influent bar screening, flow metering, and grit removal, followed by primary sedimentation, biofiltration, conventional activated sludge and secondary sedimentation. Secondary effluent is applied to agricultural fields at agronomic rates. Excess flows are chlorinated, dechlorinated and discharged to the San Joaquin River. Biosolids are dewatered by settling and evaporation and disposed of on-site by application to the City-owned property at agronomic rates. The discharger has requested the option to dispose of biosolids in a landfill in the future. The Report of Waste Discharge and additional reports provided by the discharger describe the current City of Manteca discharge as follows:

Monthly Average Flow:	5.72	million gallons per day (mgd)
Daily Peak Wet Weather Flow:	7.21	mgd
Design Flow (dry weather):	6.95	mgd
Average Temperature:	79.5°F Summer; 63.3°F Winter	

Discharge to the San Joaquin River (Outfall 001) averages 4.89 mgd with a maximum of 6.29 mgd.

Constituent	Units	Concentration Range	lbs/day[2] average
BOD[1]	mg/l	17 (avg)/59 (max)[5]	690
Total Suspended Solids	mg/l	14 (avg)/31 (max)[5]	570
Ammonia	mg/l	ND-42.8 [3]	720
Chloride	mg/l	100-230 [3]	5600
Electrical Conductivity	umhos/cm	819-1300 [3]	
Total Dissolved Solids	mg/l	540-727 [3]	26,000
Aluminum	mg/l	0.07-0.35 [4]	6.1
Iron	mg/l	0.17-0.73 [4]	20
Manganese	mg/l	0.013-0.12 [4]	2.0
Arsenic	ug/l	11-14 [4]	0.5
Copper	ug/l	7.4-13 [4]	0.4
Cyanide	ug/l	1.5-31 [4]	0.2
Dibromochloromethane	ug/l	ND-1.2 [4]	0.02
Bromodichloromethane	ug/l	1-3.5 [4]	0.08
2,4,6-Trichlorophenol	ug/l	ND-11 [4]	0.2
Bis(2-ethylhexyl)phthalate	ug/l	0.9-7 [4]	0.16
Mercury	ug/l	0.013-0.028 [4]	0.00077

1 5-day, 20°C biochemical oxygen demand
2 Based on 4.89 mgd
3 January 1998 to December 2002 monitoring reports
4 January 2002 to December 2002 data collection
5 Form 2A of the Report of Waste Discharge

Discharge to land averages 2.0 mgd.

Constituent	Units	Concentration Range	lbs/day[2] average
BOD[1]	mg/l	6-124 [3]	530
Ammonia	mg/l	12-33.8 [3]	330
Nitrate	mg/l	0-9.8	25
Electrical Conductivity	umhos/cm	946-1354 [3]	
Total Dissolved Solids	mg/l	557-614 [3]	9800

1 5-day, 20°C biochemical oxygen demand
2 Based on 2.0 mgd
3 January 2002 to December 2002 monitoring reports

4. The municipal treatment system capacity will be expanded through the addition of primary and secondary treatment units that will be similar to and parallel to the existing units. In addition, nitrification, denitrification, tertiary filtration, and UV disinfection will be added to improve the effluent quality. The expansion will include additional sludge digestion and dewatering units, as well as improvements to buildings, pump stations, ponds, and chemical handling. Chemical additions of sodium hydroxide, lime, sodium hypochlorite, or similar products may be required to control pH, alkalinity and disinfection in the plant processes. Additional expansion of the municipal waste collection system is planned to support further development of the City. In order to mitigate thermal impacts of the discharge to the San Joaquin River, the treated municipal wastewater will be discharged only during the outgoing tide. The Report of Waste Discharge describes the proposed City of Manteca discharge as follows:

Design Flow (dry weather): 9.87 mgd municipal sanitary waste
Average Temperature: 81°F Summer; 62°F Winter

Constituent	Units	30-Day[4] Average	Daily[4] Maximum	lbs/day[2] average
BOD[1]	mg/l	10	50	820
Total Suspended Solids	mg/l	10	50	820
Ammonia (as N)	mg/l	2[3]		160
Total Dissolved Solids	mg/l	640		53,000
Total Organic Carbon	mg/l	13		1100
Chlorine Residual	mg/l		0.1	
Settleable Matter	mg/l	0.1	0.2	8
Oil and Grease	mg/l	10	15	820
Total Coliform Organisms	MPN/100 ml	2.2[5]	23[6]	
NTU	NTU units	2[7]	10[8]	
pH	pH units		6.5-8.0[9]	

Footnotes next page

1 5-day, 20°C biochemical oxygen demand
2 Based on 9.87 mgd
3 0.5 mg/l during certain low flow conditions
4 Table 5, Basis of Design Report, August 2002
5 7-day mean
6 30-day maximum
7 Daily Average
8 Maximum anytime
9 Revised to 8.0 per 17 October 2002 letter from City of Manteca

A separate industrial collection system that was constructed earlier will deliver food processing waste to an aeration basin that will be separate from the main treatment plant prior to disposal to land. Discharge to land averages 2.0 mgd, which includes up to 0.55 mgd of food processing waste, and contains the following:

Constituent	Units	Concentration average	lbs/day[2] average
BOD[1]	mg/l	143 [3]	2400
Total Nitrogen	mg/l	9 [3]	150

1 5-day, 20°C biochemical oxygen demand
2 Based on 2.0 mgd
3 Wastewater Management Plan, August 2002

5. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a major discharge.

BENEFICIAL USES/WATER QUALITY CONTROL PLANS

6. The Regional Board adopted a *Water Quality Control Plan*, *Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

7. The beneficial uses of the Delta downstream of the discharge as identified in Table II-1 of the Basin Plan are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, water contact recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

8. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.

9. Clean Water Act Section 303(a-c), required states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "[t]*he numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses*." The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and electrical conductivity. Numeric Basin Plan objectives that are applicable to this discharge and which have been incorporated as Receiving Water Limitations include:

   a. *Dissolved Oxygen*—The Basin Plan includes a water quality objective that within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below 5.0 mg/l in all Delta waters except in those waters designated otherwise. Numeric Receiving Water Limitations for dissolved oxygen are included in this Order and are based on the Basin Plan objectives.

   b. *pH*—The Basin Plan includes numeric water quality objectives that the pH "…*not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*." Numeric Receiving Water Limitations for pH are included in this Order and are based on the Basin Plan objectives for pH.

   c. *Turbidity*—The Basin Plan includes a water quality objective that "[i]*ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

      - *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
      - *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*
      - *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
      - *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent."*

   A numeric Receiving Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

10. The State Water Resources Control Board (State Board or SWRCB) on 16 May 1974, adopted Resolution No. 74-43 titled "Water Quality Control Policy for the Enclosed Bays and Estuaries of California". The requirements within this Order are consistent with the Policy.

11. The State Board adopted the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary on 22 May 1995 (Bay/Delta Plan). The Plan includes water quality objectives, which are implemented as part of this Order.

12. The Basin Plan contains the "Policy for Application of Water Quality Objectives" (Implementation Policy) that, among other policies, establishes policies for implementation of narrative water quality objectives. This Implementation Policy states, in part,

> "Where compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives. To evaluate compliance with the narrative water quality objectives, the Regional Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations . . ."

Narrative water quality objectives applied in this Order include (1) the "Chemical Constituents" objective, which states that "waters shall not contain chemical constituents that adversely affect beneficial uses. The Chemical Constituent objective also lists specific numeric objectives for certain constituents and incorporates state Maximum Contaminant Levels (MCLs) promulgated in Title 22 California Code of Regulations (CCR) Division 4, Chapter 15, and (2) the "Narrative Toxicity Objective", which states, in part, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."

13. The SWRCB Water Quality Control Plan for Control of Temperatures in Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) is applicable to this discharge. For purposes of the Thermal Plan, the Discharger is considered to be an Existing Discharger of Elevated Temperature Waste.

ANTIDEGRADATION

14. State Board Resolution No. 68-16 (hereafter Resolution 68-16) and 40 Code of Federal Regulations (CFR) section 131.12 require the Regional Board, in regulating discharge of waste, to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies. Resolution 68-16 requires the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

15. With regard to surface water, the receiving water may exceed applicable water quality objectives for certain constituents as described in this Order. However, this Order requires the discharger, in accordance with specified compliance schedules, to meet requirements that will result in the use of best practicable treatment or control of the discharge and will result in compliance with water quality objectives. Table 1 of the information sheet provides an analysis of the mass loading to the receiving water for a number of constituents based on current operations and for an expanded discharge flow following plant upgrades. This Order requires compliance with technology-based standards and more stringent water quality-based standards. In developing effluent limitations, this Order allows the use of some of the assimilative capacity of the receiving water based on the current performance of the discharger and is consistent with the SIP. Where assimilative capacity is available in the receiving water, this Order does not authorize the full use of the assimilative capacity. This Order is consistent with California Water Code section 13263(b). Any further use of the assimilative capacity would not be consistent with Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant. The total allowable discharge to surface water of 9.87 mgd has been increased from 6.95 mgd from the previous Order. The discharge is consistent with Resolution 68-16 and 40 CFR section 131.12 because this Order requires the discharger to meet requirements that will result in best practicable treatment or control to assure that pollution or nuisance will not occur prior to allowing flows to increase.

16. With regard to groundwater, domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, and metals. The Discharger's use of unlined ponds and the application of wastewater and sludge to land may result in an increase in the concentration of these constituents in groundwater. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

    a. The degradation is limited in extent;
    b. The degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
    c. The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable control technology (BPCT) measures; and
    d. The degradation does not result in water quality less than that prescribed in the Basin Plan, e.g., does not exceed water quality objectives.

    As further discussed in Findings 18-20 and in the Provisions, the discharge to land authorized by this Order must comply with ground water limitations, groundwater monitoring requirements, and a schedule to evaluate whether the Discharger is implementing best practicable treatment or control of the discharge. Compliance with this Order will result in use of best practicable treatment or control and will not further degrade the groundwater.

17. On 4 February 2003, the State Board adopted the 2002 California 303(d) list of impaired water bodies. The listing for the eastern portion of the Delta waterways includes the organo-phosphate pesticides (diazinon and chlorpyrifos), organo-chlorine Group A pesticides (including the organo-chlorine pesticides DDT, endrin aldehyde, and lindane), mercury, and unknown toxicity. The listing for the San Joaquin River downstream of the discharge also includes organic enrichment/low dissolved oxygen. These listings require review and assessment of effluent quality to determine if applicable effluent limitations are necessary. The USEPA requires the Regional Board to develop total maximum daily loads (TMDLs) for each 303(d) listed pollutant.

GROUNDWATER

18. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including an assessment of all wastewater-related constituents which may have migrated to groundwater, the vertical and lateral extent of any degradation, and an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the discharge, the incremental change in waste concentration (when compared with background) may not be increased. If groundwater quality has been or may be degraded by the discharge, this Order may be reopened and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan.

19. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR, Section 20005 et seq. (hereafter Title 27). The exemption, pursuant to Title 27, CCR, Section 20090(a), is based on the following:

    a. The waste consists primarily of domestic sewage and treated effluent;

    b. The waste discharge requirements are consistent with water quality objectives; and

    c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

20. This Order requires the Discharger to prepare technical and monitoring reports as authorized by California Water Code (CWC) Section 13267. This Order also requires that the Discharger conduct groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are

necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16, and to assure compliance with this Order. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

BIOSOLIDS

21. USEPA has promulgated biosolids reuse regulations in 40 CFR 503, *Standard for the Use or Disposal of Sewage Sludge*, which establishes management criteria for protection of groundwater and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. The Regional Board is using the standards in 40 CFR 503 as guidelines in establishing this Order, but the Regional Board is not the implementing agency for 40 CFR 503 regulations. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to USEPA, which are not covered by this Order.

22. Biosolids, food processing wastewater, and treated municipal wastewater are applied to the City-owned lands. Only the treated municipal wastewater is applied to leased lands. This order requires that the City demonstrate that there is adequate capacity on the City-owned lands to agronomically apply the food processing wastes and all biosolids.

COLLECTION SYSTEM

23. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs this raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) for temporary storage may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these storage/conveyance facilities.

24. Sanitary sewer overflows consist of varying mixtures of domestic sewage, industrial wastewater, and commercial wastewater. This mixture depends on the pattern of land use in the sewage collection system tributary to the overflow. The chief causes of sanitary sewer overflows include grease blockages, root blockages, debris blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm or groundwater inflow/infiltration, lack of capacity, and contractor caused blockages.

25. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause temporary exceedances of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.

26. The Discharger is expected to take all necessary steps to adequately maintain and operate its sanitary sewer collection system. This Order requires the Discharger to prepare and implement a Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan.

REASONABLE POTENTIAL

27. California Water Code Section 13263.6(a) requires that "the regional board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRA) indicate as discharged into the POTW, for which the State Board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective".

    The most recent toxic chemical data report does not indicate any reportable off-site releases or discharges to surface waters for this facility. Therefore, a reasonable potential analysis based on information from EPCRA cannot be conducted. Based on information from EPCRA, there is no reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Board plan, so no effluent limitations are included in this permit pursuant to CWC Section 13263.6(a).

    However, as detailed elsewhere in this permit, available effluent data indicate that there are constituents present in the effluent that have a reasonable potential to cause or contribute to exceedances of water quality standards and require inclusion of effluent limitations based on federal and state law and regulations.

28. USEPA adopted the *National Toxics Rule* (NTR) on22 December 1992, which USEPA revised on 4 May 1995 and 9 November 1999, and the *California Toxics Rule*(CTR) on 18 May 2000, which USEPA revised on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The State Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP), which contains policies and procedures for implementation of the *National Toxics Rule* and the *California Toxics Rule.*

29. Federal regulations, at 40 CFR Section 122.44 require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Water quality standards include the National Toxics Rule, the California Toxics Rule, and Basin Plan water quality objectives. 40 CFR Section 122.44(d) sets forth requirements that apply to the state to implement narrative water quality standards. 40 CFR Section 122.44(d)(vi)(A)-(C) requires the effluent limit to be based on one or more of three options, including using EPA's water quality criteria, a proposed state criterion (i.e., water quality objective), or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Board's "Policy for

Application of Water Quality Objectives"). Based on information submitted as part of the application, in studies, and in monitoring reports, the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for aluminum, ammonia, arsenic, chlorine, copper, cyanide, bis(2-ethylhexyl)phthalate, bromodichloromethane, dibromochloromethane, electrical conductivity, iron, manganese, MBAS, mercury, nitrate, nitrite, pH, temperature, total dissolved solids and 2,4,6-trichlorophenol. Final effluent limitations and/or interim performance-based effluent limitations and interim requirements with compliance schedules for the pollutants listed above are included in this Order. In addition, this Order contains provisions that:

a. Require the Discharger to conduct a study to provide information as to whether the levels of dioxins in the discharge cause or contribute to an in-stream excursion above a water quality standard, including Basin Plan numeric or narrative objectives;

b. If the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, requires the Discharger to submit information to calculate effluent limitations for those constituents; and

c. Allows the Regional Board to reopen this Order and include effluent limitations for those constituents.

On 10 September 2001, the Executive Officer issued a letter, in conformance with California Water Code Section 13267, requiring the Discharger to prepare a technical report assessing water quality. This Order is intended to be consistent with these requirements in requiring sampling for dioxins to determine the full water quality impacts of the discharge. The technical report requirements are intended to be more detailed, listing specific constituents, detection levels, and acceptable time frames and shall take precedence in resolving any conflicts.

30. As stated in the above Finding, the USEPA adopted the NTR and the CTR, which contains water quality standards applicable to this discharge. The SIP contains policies and procedures for implementation of the NTR and CTR. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year, and; be included in the Provisions. The interim limitations in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. Where actual sampling shows an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration has been established as the interim limitation. When there are less than ten sampling data points available, the *Technical Support Document for Water Quality*

Based Toxics Control ((EPA/505/2-90-001) TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed sampling result to obtain the daily maximum interim limitation (TSD, Table 5-2). The Regional Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with NTR- and CTR-based effluent limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final effluent limitations, but in compliance with the interim effluent limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the effluent limitation can be achieved.

31. **Dilution:** As discussed in the information sheet, the Discharger developed a model to assess dilution and mixing zones. The accuracy of the model results are questionable due to a lack of site data to calibrate and validate the model, the lack of accounting for tidal cycles and recirculation, and the lack of accounting for the Brown Sand, Inc. discharge adjacent to the outfall. However, because there is no in-stream flow meter in the vicinity of the discharge to provide real-time data, this Order relies on flow information from the Vernalis monitoring station, as well as some of the model information as it is available. This Order also requires the Discharger to install a flow monitoring station in the vicinity of the outfall to provide real-time data to better assess available dilution.

    In the immediate vicinity of the outfall, little dilution is available for the side-bank discharge. In addition, the dilution is reduced due to the added discharge from the Brown Sand impoundment immediately downstream. No dilution is available for the acute aquatic criteria due to the limited mixing of the side-bank discharge near the outfall, the commingling with an adjacent NPDES discharge, the 1-hour exposure interval that the acute criteria are intended to protect, and the periods of slack tide that can occur at low river flows.

    The SIP requires that a mixing zone not dominate or compromise the integrity of the entire water body and shall be as small as practicable. The thermal modeling, while not proven to be accurate, as discussed in the information sheet, presented a spatial definition to the changes in temperature that occur in the receiving water. This was used to define a mixing zone for constituents subject to chronic aquatic criteria and dilution to be determined at the edge of this mixing zone. As discussed further in the information sheet, the mixing zone will be restricted to the surface layer of the water column in a plume hugging the eastern shore of the river and extending to 450 feet downstream of the outfall. Temperature differences at the edge of this mixing zone indicate that a 4:1 dilution exists at the edge of this mixing zone. Therefore, for constituents subject to chronic aquatic criteria, a 4:1 dilution will be applied. This mixing zone

will provide protection to the benthic community and minimize the impacts of the discharge to the river.

The overlap of the plumes from the City of Manteca and the Brown Sand impoundment will limit the extent of a mixing zone for arsenic, a constituent of mutual concern between these discharges. Additionally, the receiving water monitoring shows an average arsenic concentration of 3.0 ug/l, exceeding the USEPA recommended water quality criterion for protection of human health. The receiving water lacks assimilative capacity for arsenic. There is no dilution available for arsenic under these conditions.

The assimilative capacity of the receiving water is dependent on the background concentration of the receiving water. Data collected in 2002 indicates that the receiving water has no assimilative capacity, and therefore no dilution can be granted for aluminum, electrical conductivity, iron, manganese, and mercury.

Human health-based criteria that are based on safe-exposure levels for lifetime exposure (e.g., cancer risk estimates) utilize the harmonic mean flow to represent the receiving water flow. A steady state analysis utilizing the harmonic mean flow at Vernalis provides a dilution of 222:1. The Regional Board is not required to grant a mixing zone or allocate the full assimilative capacity of the receiving water. For limitations based on these human health criteria, dilution is limited to the amount required to maintain compliance. Where the ambient background concentrations are lower than the applicable human health criterion, the dilution credits determined in Table 12 of the Information Sheet apply for the determination of effluent limitations for carcinogens.

PRIORITY POLLUTANTS

32. **Copper:** The Report of Waste Discharge submitted by the Discharger indicates the presence of copper at levels that exceed the numeric water quality objective for copper contained in the Basin Plan (Table III-1). Based on twelve effluent samples, the maximum reported copper value is 13 ug/l, which is within a range that may cause the receiving stream to exceed the water quality objective for copper. Copper toxicity is hardness dependent and data submitted by the Discharger indicates a worst-case effluent hardness concentration of 170 mg/l as $CaCO_3$. Based on a hardness of 170 mg/l, the calculated hardness dependent copper effluent limitations are 7.9 ug/l as a monthly average and 10.4 ug/l as a daily maximum. Effluent limitations for copper are included in this Order for the protection of freshwater species, and are based on the Basin Plan objective. The determination of the final effluent limitations, which are hardness dependent, are summarized in Table 11 of the Information Sheet.

33. **Cyanide:** The Report of Waste Discharge submitted by the Discharger indicates the presence of cyanide at levels that exceed the water quality objective for cyanide contained in the Basin Plan (Table III-1). Based on twelve effluent samples, the maximum reported cyanide value is 31 ug/l, which may cause the receiving stream to exceed the Basin Plan objective of 0.01 mg/l. Effluent limitations for cyanide are included in this Order based on the Basin Plan objective and

calculations outlined in the TSD. The calculated effluent limitations for cyanide are 3.7 ug/l as a monthly average and 10.0 ug/l as a daily maximum (see Table 11 of the Information Sheet).

34. **Arsenic:** Arsenic is an inorganic priority pollutant that produces human health effects and is considered a carcinogen. Data, submitted by the discharger between January 2002 and December 2002, indicates arsenic is present in the effluent at levels that exceed the water quality objective for arsenic contained in the Basin Plan (Table III-1). The Basin Plan numeric objective for the San Joaquin-Sacramento Delta is 10 ug/l. Also, the new USEPA Primary MCL for arsenic is 10 ug/l. The maximum concentration in the effluent is 14 ug/l. The Regional Board finds that there is a reasonable potential for the discharge to cause or contribute to an excursion above the numeric water quality objective for arsenic. An effluent limitation for arsenic is included in this Order based on the Basin Plan numeric objective and the calculations outlined in Section 5.4.4 of the TSD. The effluent limitation for arsenic is 10 ug/l as a monthly average (see Table 11 of the Information Sheet).

35. **Total Trihalomethanes and Chloroform:** Information submitted by the Discharger indicate that the effluent contains trihalomethanes (THMs) and chloroform. The Basin Plan contains the "Chemical Constituent" objective that requires, at a minimum, that waters with a designated MUN use not exceed California MCLs. In addition, the Chemical Constituent objective prohibits chemical constituents in concentrations that adversely affect beneficial uses. The California's Drinking Water Standard primary MCL for total THMs is 100 ug /l. The USEPA primary MCL for total THMs is 80 ug/l, which was effective on 1 January 2002 for surface water systems that serve more than 10,000 people. Pursuant to the Safe Drinking Water Act, DHS must revise the current total THMs MCL in Title 22 CCR to be as low or lower than the USEPA MCL. The State Board, in WQO No 2003-0002, stated that the Drinking Water Standard primary MCL for total THMs, which includes chloroform, of 80 ug/l could be applied to address chloroform in the discharge regulated in that Order. In addition, the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the regional boards, departments and offices within Cal/EPA. This cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/l (ppb) at the 1-in-a-million cancer risk level with the consumption of the drinking water over a 70-year lifetime. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters.

Municipal and domestic supply is a designated beneficial use of the receiving water. However, there are no known drinking water intakes on the San Joaquin River within several miles downstream of the discharge, and chloroform is a non-conservative pollutant. Therefore, to protect the MUN use of the receiving waters, the Regional Board finds that, in this specific circumstance, application of the USEPA MCL for total THMs for the effluent is appropriate, as

long as the receiving water does not exceed the OEHHA cancer potency factor's equivalent receiving water concentration at a reasonable distance from the outfall (e.g., before reaching the drinking water intakes). A review of effluent data collected from January 2002 through December 2002 showed total THMs with a maximum concentration of 17 ug/l and an average concentration of 10 ug/l. Chloroform data collected over the same period showed a maximum concentration of 12 ug/l and an average concentration of 8 ug/l. Data is not available regarding the constituent concentrations in the receiving water. Considering the available dilution based on the harmonic mean flow of the San Joaquin River, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the water quality objective for MUN use by causing exceedance of the USEPA primary MCL for total THMs or the chloroform OEHHA cancer potency factor's equivalent receiving water concentration. Therefore, effluent limitations for total THMs and chloroform are not included in this Order.

36. **Bromodichloromethane (BDCM) and dibromochloromethane (DBCM):** Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for BDCM and DBCM. The CTR includes standards for the protection of human health based on a one-in-a-million cancer risk for these organic constituents. The criteria for waters from which both water and organisms are consumed are 0.56 ug/l and 0.41 ug/l for BDCM and DBCM, respectively. The maximum observed effluent concentrations for BDCM and DBCM are 3.5 ug/l and 1.2 ug/l, respectively. Effluent limitations for BDCM and DBCM are included in this Order based on the CTR criteria for the protection of human health. The Discharger is able to comply with the limitations.

37. **Trichlorophenol:** Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for 2,4,6-trichlorophenol. The CTR includes standards for the protection of human health. The 2,4,6-trichlorophenol criteria for the protection of human health based on a one-in-a-million cancer risk for waters from which both water and aquatic organisms are consumed is 2.1 ug/l. The maximum observed effluent 2,4,6-trichlorophenol concentration is 11 ug/l. 2,4,6-trichlorophenol has not been detected in the upstream receiving water. Effluent Limitations for 2,4,6-trichlorophenol are included in this Order based on the CTR standard for the protection of human health. The Discharger is able to comply with the effluent limitations.

38. **Bis(2-ethylhexyl)phthalate:** Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for bis(2-ethylhexyl)phthalate. The CTR includes a standard for the protection of human health based on a one-in-a-million cancer risk for bis(2-ethylhexyl)phthalate of 1.8 ug/l. The maximum observed effluent bis(2-ethylhexyl)-phthalate concentration is 7 ug/l. Bis(2-ethylhexyl)phthalate has not been detected in the upstream receiving water. Effluent Limitations for bis(2-ethylhexyl)phthalate are included in this Order based on the CTR criteria for the protection of human health. The Discharger is able to comply with the effluent limitations,

39. **Mercury:** Based on information submitted by the Discharger, the discharge contains mercury. The Delta waterways are listed in accordance with Clean Water Act Section 303(d) as impaired for mercury based on bioaccumulation of this pollutant in fish tissue. The CTR contains criteria for mercury. The CTR criteria, however, do not address bioaccumulation in the river. The WQCF effluent contains detectable levels of mercury below CTR priority pollutant criteria. Since the CTR criteria are not based on bioaccumulation, the discharge was evaluated based on the Basin Plan's narrative toxicity objective. Any loading of mercury from the discharge may have the reasonable potential to cause or contribute to an excursion above the narrative toxicity objective by causing bioaccumulation in fish tissue. Health advisories by the Department of Health Services remain in effect for human consumption of fish in the Delta, including the San Joaquin River at Manteca, due to excessive concentrations of mercury in fish flesh. These current warnings and available fish tissue data confirm that there is currently no assimilative capacity for mercury. Therefore, water quality based effluent limitations for mercury that properly address bioaccumulation are required. A TMDL for mercury is scheduled to be completed by December 2005. For situations like this, the SIP recommends that limiting mass loading of the bioaccumulative pollutant should be considered in the interim at representative, current levels pending development of the TMDL. A mass load limit for mercury is included in this Order. If the Regional Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for this Discharger.

NONPRIORITY POLLUTANTS

40. **Temperature:** The State Board Water Quality Control Plan for Control of Temperatures in Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (the Thermal Plan) is applicable to this discharge. For the purposes of compliance with the Thermal Plan, the discharger is considered to be an existing discharger of elevated temperature waste. Monitoring by the discharger indicates that the 20 ^{o}F limitation of Objective 5.A.(1)a of the Thermal Plan is occasionally exceeded in winter months when the receiving water is at its lowest temperatures. Modeling conducted by Resource Management Associates (RMA), subject to the model limitations discussed in the information sheet, indicates that the current and the expanded flows with continuous discharge also exceed both the 1 degree and 4 degree requirements of Objectives 5.A.(1)b and 5.A.(1)c of the Thermal Plan. The modeling also demonstrates that a timed discharge, that is, discharging only on the outgoing tide, for the increased flow exceeds only the 4 degree requirement, not the 1 degree requirement. The Discharger has requested an exception to the 4 degree requirement of Objective 5.A.(1)c of the Thermal Plan which requires that the discharge shall not cause a surface water temperature rise greater than 4 ^{o}F above the natural temperature of the receiving waters at any time or place and has also requested a one month averaging period to meet the 20 degree limit of Objective 5.A.(1)a. The Discharger has not yet implemented measures necessary to meet conditions for any exception, including installation of an in-stream real-time flow monitor in the vicinity of the outfall or construction of storage basins to provide for effluent discharges on out-going tides. Therefore, effluent and receiving water limitations are included to achieve compliance with the Thermal Plan. This Order requires that the discharger comply with the Thermal Plan and implement the necessary

mitigations, such as discharging during the outgoing tide, to bring the existing discharge into compliance and maintain compliance when increasing its effluent discharge rate. This Order may be reopened to include alternative limitations for temperature if a resolution is adopted in the future that provides exceptions for particular objectives of the Thermal Plan.

41. Studies by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the University of California at Davis, et. al., have identified the Central Valley Chinook Salmon and the Central Valley Steelhead as sensitive species that are affected by elevated temperatures in the San Joaquin River. There are four runs of salmon in the Central Valley that results in there being adults and juveniles in portions of the Delta every month of the year. Generally, adults would be moving upstream in the fall, and fry and smolt moving downstream in the winter and spring. River temperatures above 68 °F are unsuitable for supporting salmonoids. Migration of adults is usually delayed when river temperatures reach this level. In a Department of Water Resources Study, adult salmon will cease migration if water temperatures are above 70 °F. At 77 °F, adult mortality may occur. The Thermal Plan does not protect aquatic life from high temperature wastewater being discharged to an elevated temperature river. However, the Thermal Plan limits incremental increases in temperature. Discharge from the wastewater treatment plant of treated effluent with an elevated temperature may affect salmon and other migrating fish in the San Joaquin River. In so far as elevated temperature is deleterious to Chinook salmon, effluent temperature must be limited so as not to cause the receiving water to be harmful to the salmon. When the assimilative capacity of the river is diminished, effluent temperature must be held to the water quality criteria. The CALFED Bay-Delta Program target is to maintain water temperatures below 68 °F in migratory routes of anadromous fish in the spring and fall. This Order requires the Discharger to study the potential impacts to the fishery associated with a discharge of effluent with elevated temperature.

42. **pH:** The Discharger requested in a 17 October 2002 letter that the effluent pH range for discharges to the San Joaquin River be restricted to pH 6.5 to 8.0. The reason for restricting the pH of the discharge is to facilitate less restrictive ammonia effluent limitations for the discharge to the San Joaquin River. These pH limits are included in this Order.

43. **Ammonia-Nitrogen:** Treated and untreated domestic wastewater, including the discharge from the WQCF, contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. The USEPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, recommending acute criteria for ammonia that are pH-dependent and chronic criteria that are pH- and temperature-dependent. The WQCF effluent has a reasonable potential to cause or contribute to an in-stream excursion above USEPA acute and chronic water quality criteria for ammonia. Consistent with 40 CFR section 122.44(d)(vi)(A) and the Basin Plan "Policy for Application of Water Quality Objectives", this Order implements the Basin Plan

narrative toxicity objective by applying USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia. This Order includes effluent limitations for ammonia, based on the narrative toxicity objective and the USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life.

Because of the seasonal variation in pH and temperature of the receiving water and the sensitivity of the ammonia criteria to these conditions, seasonal limitations are established. For the warm weather months from 1 June to 30 September, the maximum permitted monthly average effluent pH is 8.0, the maximum historical monthly average receiving water pH is 9.1, the maximum historical monthly average effluent temperature is 27.2 F, and the maximum historical monthly average receiving water temperature is 25.7 F. The pH and temperature at the edge of a 4:1 mixing zone were estimated utilizing the USEPA DESCON program. These estimations are utilized in Table 8 of the Information Sheet to calculate effluent limitations that maintain compliance with chronic aquatic criterion in the receiving water outside of the mixing zone. Effluent limitations compliant with acute criteria for conditions at the end-of-pipe are also determined, but the more restrictive chronic criteria determine the final effluent limitations. Table 8 provides a daily maximum effluent limitation of 4.4 mg/l ammonia as N and a 30-day average effluent limitation of 2.1 mg/l. As defined by the 1999 criteria, the 4-day average CCC ammonia concentration shall not exceed 2.5 times the value of the 30-day CCC. However, considering the maximum daily limitation is less than 2.5 times the CCC in all cases, the 4-day average cannot exceed the maximum daily limitation.

For the cool weather months from 1 October to 31 May, the maximum permitted monthly average effluent pH is 8.0, the maximum historical monthly average receiving water pH is 8.5, the maximum historical monthly average effluent temperature is 25.2 F, and the maximum historical monthly average receiving water temperature is 19.6 F. The pH and temperature at the edge of a 4:1 mixing zone were estimated utilizing the USEPA DESCON program. These estimations are utilized in Table 8 to calculate effluent limitations that maintain compliance with chronic aquatic criterion in the receiving water outside of the mixing zone. Effluent limitations compliant with acute criteria for conditions at the end-of-pipe are also determined. In this case, the more restrictive acute criteria determine the final effluent limitations. Table 8 show that the acute criteria using the maximum permitted effluent pH of 8.0 provides a daily maximum effluent limitation of 5.6 mg/l ammonia as N and a 30-day average effluent limitation of 2.8 mg/l.

44. **Nitrite and Nitrate-Nitrogen:** Nitrate and nitrite are known to cause adverse health effects in humans. The Basin Plan's chemical constituents water quality objective prohibits chemical constituents in concentrations that exceed drinking water Maximum Contaminant Levels (MCLs) published in Title 22 of the California Code of Regulations or that adversely affect beneficial uses. Municipal and domestic water supply is a beneficial use of the San Joaquin River. The California Department of Health Services (DHS) has adopted Primary Maximum Contaminant Levels (MCLs) for the protection of human health for nitrite and nitrate that are equal to 1 mg/l and 10 mg/l (measured as nitrogen), respectively. Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 ug/l for the sum of nitrate and nitrite, measured as nitrogen. The discharge from the WQCF has a reasonable potential to cause or contribute to an

in-stream excursion above water quality standards for nitrite and nitrate because of the nitrification and denitrification processes. Effluent limits for nitrite and nitrate are based on the MCLs. Effluent Limitations for nitrite and nitrate are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of municipal and domestic supply.

45. **Salinity:** The discharge contains total dissolved solids (TDS), chloride and electrical conductivity. These are water quality parameters that are typically indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of the water for human consumption. There are no USEPA water quality criteria for protection of aquatic organisms for these constituents. The Basin Plan "Chemical Constituent" objective incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for electrical conductivity. The secondary California maximum contaminant level (MCL) for TDS is 500 mg/l as a recommended level, 1000 mg/l as an upper level, and
1500 mg/l as a short-term maximum. The recommended agricultural water quality goal for TDS, that would implement the narrative "Chemical Constituent" objective, is 450 mg/l as a long-term average based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The recommended agricultural water quality goal for chloride, that would implement the narrative "Chemical Constituent" objective, is 106 mg/l based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The Basin Plan water quality objectives for electrical conductivity for the South Delta are 700 umhos/cm (from 1 April to 31 August) and 1000 umhos/cm (from 1 September to 31 March). State Board Decision 1641 (D-1641) requires that the 1000 umhos/cm objective be met year round until 1 April 2005 at which time the seasonal objectives will be effective.

A review of the Discharger's monitoring reports from January 1998 through December 2002 indicates an annual average TDS effluent concentration of 634 mg/l, a lowest monthly average of 540 mg/l, and a highest monthly average of 727 mg/l. These concentrations exceed the applicable objectives. Limited TDS data collected at receiving water sample location R1 from January 2002 through December 2002 showed a TDS concentration range from 210 mg/l to 1300 mg/l with an average of 500 mg/l in 12 sampling events. The Regional Board report *Total Maximum Daily Load for Salinity and Boron in the Lower San Joaquin River (January 2002)* presented monthly average TDS data for the San Joaquin River at Vernalis from October 1976 through September 1997. The Vernalis data showed a maximum monthly average TDS of 1024 mg/l with 57 of 252 months having monthly averages greater than 500 mg/l. This data indicates that the receiving water frequently exceeds water quality objectives to protect its beneficial uses and lacks assimilative capacity for TDS. As water exported from the Delta by the State Water Project is, in part, mixed with Colorado River water to provide municipal water supply with an acceptable TDS, any increase in salt concentration effectively reduces the available water supply in Southern California (*Metropolitan Water District of Southern California, Salinity Management Study, 1998*).

Chloride concentrations in the effluent ranged from 100-230 mg/l with an average of 138 mg/l based on 16 samples collected during 2002. Background concentrations in the San Joaquin River ranged from 51-170 mg/l with an average of 98 mg/l based on results from eleven samples collected during 2002. Both the receiving water and the effluent exceed the water quality objective of 106 mg/l based on the narrative objective.

Electrical conductivity (EC) shows reasonable potential to exceed water quality objectives in both the effluent and in the receiving water. A review of the Discharger's monitoring reports from January 1998 through December 2002 shows the annual average effluent EC is 1099 umhos/cm, the lowest monthly average is 819 umhos/cm, and the highest monthly average is 1300 umhos/cm. These levels exceed the applicable objectives. EC data collected at receiving water sample location R1 from January 2002 through December 2002 show that the conductivity in the receiving water ranged from 380 umhos/cm to 1100 umhos/cm and averaged 686 umhos/cm in 12 sampling events. Hourly EC data collected at the Department of Water Resources (DWR) Mossdale monitoring station (RSAN087) from December 2000 through September 2002 show that the conductivity in the San Joaquin River ranged from 299 umhos/cm to 1131 umhos/cm and averaged 721 umhos/cm. San Joaquin River monitoring for electrical conductivity at Vernalis between 1985 and 1998 showed frequent exceedances of the EC water quality objectives (Reference Figure 1-3, *Total Maximum Daily Load for Salinity and Boron in the Lower San Joaquin River (January 2002*)). These data show that the receiving water frequently has no assimilative capacity for EC. An Effluent Limitation for electrical conductivity is included in this Order and is based on the Basin Plan water quality objective for electrical conductivity in the South Delta.

The TDS, chloride, and electrical conductivity objectives and recommended levels are all measures of the salt content of the water. Compliance with the Effluent Limitations for electrical conductivity based on the Basin Plan seasonal water quality objectives of 700 umhos/cm and 1000 umhos/cm will be protective of the chloride and TDS recommended levels; therefore, no limitations are included for chloride and TDS.

46. **Aluminum:** Aluminum concentrations in the effluent were detected in the range of 70 ug/L to 350 ug/L in 12 samples collected between January 2002 and December 2002. Aluminum was detected in the receiving water (R-1) in the range of 420 ug/L to 2200 ug/L in 12 samples collected between January 2002 and December 2002. Dissolved concentrations of aluminum in the effluent and the receiving water were significantly less than the totals listed above. The Basin Plan's chemical constituents water quality objective prohibits chemical constituents in concentrations that exceed state MCLs or that adversely affect beneficial uses. MUN is a beneficial use of the San Joaquin River. The Primary and Secondary MCLs for aluminum are 1000 ug/l and 200 ug/l respectively. The Basin Plan contains a narrative toxicity objective. Consistent with 40 CFR 122.44(d), USEPA's ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum expressed as total recoverable are 750 ug/l (1-hour average) and 87 ug/l (4-day average), and are appropriate to implement the narrative toxicity objective. Since both the receiving water and the effluent exceed USEPA's ambient water quality criteria and the secondary MCL, no dilution can be granted. The effluent has reasonable potential to cause or contribute to an in-stream excursion above water quality objectives for aluminum.

Therefore, this Order includes an effluent limitation for aluminum of 71ug/l as a monthly average and 143 ug/l as the daily maximum.

47. **Iron:** Iron concentrations in the effluent ranged from 170 ug/l to 730 ug/l while background concentrations in the San Joaquin River ranged from 780 ug/l to 2800 ug/l based on results from 12 samples collected between January 2002 and December 2002. The Basin Plan chemical constituent objective includes a receiving water objective in Table III-1 for iron of 300 ug/l in the Delta, and the secondary MCL for iron of 300 ug/l. Both the receiving water and the effluent exceed the Basin Plan numeric objective and the secondary MCL. Therefore, effluent limitations are included in this Order based on the Basin Plan chemical constituents objective.

48. **Manganese:** Manganese concentrations in the effluent ranged from 13 ug/l to 120 ug/l while background concentrations in the San Joaquin River ranged from 82 ug/l to 220 ug/l based on results from 11 samples collected between January 2002 and December 2002. The Basin Plan chemical constituent objective includes a receiving water objective in Table III-1 for manganese of 50 ug/l in the Delta, and the secondary MCL for manganese of 50 ug/l. Both the receiving water and the effluent exceed the Basin Plan numeric objective and the secondary MCL. Therefore, effluent limitations are included in this Order based on the Basin Plan chemical constituents objective.

49. **Chlorine:** The Discharger currently uses chlorine for disinfection and has reported that it uses sodium hypochlorite for maintenance. Chlorine is extremely toxic to aquatic organisms. The Discharger uses a sulfur dioxide process to dechlorinate the effluent, but will discontinue this with the installation of the UV disinfection system. Because of the existing chlorine use and the future use of hypochlorite solutions without effluent dechlorination, there is reasonable potential for chlorine to be discharged at toxic concentrations. The Basin Plan contains a narrative toxicity objective. Consistent with 40 CFR 122.44(d), it is appropriate to use the USEPA ambient water quality criteria for chlorine for protection of freshwater aquatic life of 11 ug/l as a 4-day average (chronic) concentration, and 19 ug/l as a 1-hour average (acute) concentration to implement the narrative toxicity objective. Therefore, this Order includes water quality based effluent limitations for chlorine based on the USEPA ambient criteria to protect freshwater aquatic life.

50. **Methylene blue active substances (MBAS):** The effluent contains MBAS at levels that may cause or contribute to exceedances in the receiving waters of water quality objectives in the Basin Plan. The Basin Plan includes the "Chemical Constituents" objective that incorporates state MCLs applicable to waters designated MUN. MUN is a designated beneficial use of the San Joaquin River. The Secondary MCL Consumer Acceptance Limit is 500 ug/l for foaming agents (MBAS). The Basin Plan also includes water quality objectives that water not contain floating material or taste- or odor-producing substances in concentrations that causes nuisance or adversely affect beneficial uses. The Basin Plan identifies non-contact water recreation, which includes aesthetic enjoyment, as a beneficial use of the San Joaquin River. MBAS concentrations in excess of the Secondary MCL-Consumer Acceptance Limit produce aesthetically undesirable froth, taste, and odor. Foam has been observed on the surface of the discharge plume from the WQCF. The maximum observed effluent MBAS concentration is

1800 ug/l. The maximum observed upstream receiving water MBAS concentration is less than 20 ug/l. An Effluent Limitation for MBAS is included in this Order based on of the Basin Plan water quality objectives for chemical constituents, floating material, and tastes and odors.

51. **Molybdenum:** The recommended agricultural water quality goal for molybdenum, that would implement the narrative "Chemical Constituent" objective, is 10 ug/l based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Molybdenum was not monitored in the effluent or in the receiving waters. Because of the uncertainty associated with the lack of monitoring, additional studies of this constituent are warranted to more thoroughly evaluate reasonable potential for this constituent to exceed criteria. MRP No. R5-2004-0028 specifies monitoring for this pollutant. If the monitoring shows a reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened to consider incorporation of appropriate effluent limitations.

52. **Carbofuran:** Carbofuran was detected in the effluent and receiving water at concentrations greater than the OEHHA criterion of 1.7 ug/l. Because the data was greater than the method detection limit but less than the laboratory's reporting limit, the data was flagged as "detected but not quantified". Additional monitoring is required. If the monitoring shows a reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened to consider incorporation of appropriate effluent limitations.

53. **Acute Bioassay:** The new USEPA test procedure for acute bioassays (EPA-821-R-02-012, Fifth Edition, October 2002) constitutes a more stringent acute toxicity limitation. The finding for ammonia indicated that there is a reasonable potential for the RWCF effluent to cause or contribute to an in-stream excursion above acute and chronic water quality standards for ammonia. To comply with the acute toxicity requirement of this Order and to comply with the Basin Plan narrative toxicity objective, the Discharger must reduce effluent ammonia concentrations to comply with the new effluent limitations by 31 March 2004. Monitoring Reporting Program No. R5-2004-0028 allows the bioassay to be modified to eliminate ammonia-related toxicity until 31 March 2004, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity. The time schedule is authorized to be included in the Monitoring and Reporting Program based on 40 CFR § 122.47.

54. **Chronic Bioassay:** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if the State Board adopts a chronic toxicity water quality objective, this Order may be reopened and a limitation based on that objective included.

DISSOLVED OXYGEN ISSUES

55. The dissolved oxygen (DO) objectives applicable to the San Joaquin River are as follows:

    a. The Basin Plan prescribes a minimum DO concentration in the San Joaquin River of 5.0 mg/l. This standard is applicable throughout the year.

    b. The Bay/Delta Plan prescribes a minimum DO concentration of 6.0 mg/l in the San Joaquin River inside the reach from Turner Cut to Stockton during the period 1 September through 30 November. This higher DO concentration was imposed to enhance aquatic conditions during critical migration periods for salmon.

56. The DO objectives are frequently not met in the San Joaquin River, leading to the Clean Water Act section 303(d) listing. In 1998, the Regional Board classified the DO impairment within the San Joaquin River as a Toxic Hot Spot, making it a high priority problem for correction. Since the spring of 1999, the Discharger and other stakeholders have participated in the steering committee for the development of the DO TMDL for the San Joaquin River in the Deep Water Ship Channel (DWSC). A TMDL implementation plan was submitted to the Regional Board in February 2003. Staff has developed and submitted to the USEPA in June 2003 a TMDL report for controlling the problem. The existing low DO conditions in the Stockton DWSC are partially the result of channel morphology, and point and non-point sources that are beyond the control of the Discharger. The Discharger will make a significant reduction in the magnitude of its contribution to the DO problem by implementation of more stringent ammonia and BOD effluent limitations through the construction of nitrification, denitrification, and tertiary coagulation and filtration facilities. These facilities will prevent ammonia toxicity and reduce the nitrogenous and carbonaceous biochemical oxygen demand that is presently exerted on the San Joaquin River.

    Based on the above information, further action by the Discharger to reduce its impact on the San Joaquin River DO concentration, beyond the requirements of this permit, will not be required by the Regional Board until such time as the TMDL for DO has been developed and approved by USEPA. This Order contains a provision to allow for the permit to be reopened to consider modification of effluent limitations after the DO TMDL is finalized.

DISINFECTION/FILTRATION

57. The beneficial uses of the San Joaquin River include municipal supply, water contact recreational uses and agricultural irrigation supply, and there is, at times, less than 20:1 dilution. Recreational uses identified in the immediate vicinity of the WQCF outfall include boating, skiing, swimming, and fishing. A number of agricultural diversions have been identified through a search of the State Board, Water Rights Division database. Within an approximate one-mile radius of the outfall, there are approximately five agricultural diversions identified in the database. One of the agricultural diversions is just downstream and in the immediate vicinity of the outfall.

To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. Filtration is also necessary prior to UV disinfection to prevent any solids from interfering with the performance of the UV disinfection system. The wastewater must be treated to tertiary standards (filtered) to protect contact recreation and food crop irrigation uses and to assure the reliability and effectiveness of UV disinfection.

The California Department of Health Services (DHS) has developed reclamation criteria, CCR, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent **total coliform** levels not exceed 2.2 MPN/100 ml as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply DHS' reclamation criteria because the San Joaquin River is used for irrigation of agricultural land and for contact recreational purposes. The stringent disinfection criteria of Title 22 are appropriate since the relatively undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a **turbidity** effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which would result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations.

The establishment of tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirements is included as a Provision in this Order. This Order provides interim effluent limitations for BOD, TSS, and total coliform, which the Discharger is currently capable of meeting. Full compliance with the final effluent limitations for BOD, TSS, total coliform, and turbidity are not required by this Order until completion of tertiary treatment facilities, or **1 February 2009**, whichever is first. Adequate time is provided for the Discharger to propose alternatives that are still protective of public health and irrigation uses, but at a reduced cost. The permit may be reopened at such time as the Discharger proposes an alternative that is protective of public health and irrigation uses. Alternatives to tertiary treatment, such as expanded land disposal, would require modification of

the permit.

58. This Order contains Effluent Limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with California Water Code, Section 13241, the Regional Board has considered the following:

    a. As stated in the above Findings, the past, present and probable future beneficial uses of the receiving stream include municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

    b. The environmental characteristics of the hydrographic unit, including the quality of the available water, will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California Department of Health Services (DHS).

    c. Fishable and swimmable water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area.

    d. The economic impact of requiring an increased level of treatment has been considered. The Discharger has estimated that the increased level of treatment will cost approximately $5.1 million. The current monthly domestic sewer user fee is $ 11.05 (2000). The California average monthly domestic sewer user fee is $19.71 (2000). The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, which includes prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment.

    e. The requirement to provide tertiary treatment for this discharge will not adversely impact the need for housing in the area. The potential for developing housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DHS recommends that, in order to protect the public health, relatively undiluted wastewater effluent must be treated to a tertiary level for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

    f. It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water

is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

g. The Regional Board has considered the factors specified in CWC Section 13263, including considering the provisions in CWC Section 13241, in adopting the disinfection and filtration requirements under Title 22 criteria. The Regional Board finds, on balance, that these requirements are necessary to protect the beneficial uses of the San Joaquin River, including water contact recreation and irrigation uses.

STORMWATER

59. Federal Regulations for stormwater discharges are contained in 40 CFR Parts 122, 123, and 124. The regulations require specific categories of facilities, which discharge stormwater associated with industrial activity (stormwater) to obtain NPDES permits and implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate industrial stormwater pollution.

60. Regulated stormwater discharges include those from facilities used in storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1 mgd or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farmlands, domestic gardens, or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with Clean Water Act Section 405.

61. The State Board adopted Order 97-03-DWQ (General NPDES Permit No. CAS000001) specifying waste discharge requirements for discharges of stormwater associated with industrial activities, excluding construction activities, and requiring submittal of a Notice of Intent by industries to be covered under the Order. This Order further specified that if an individual Order is adopted for stormwater runoff from a facility, then the General Permit would no longer apply. Since all stormwater that falls on the treatment plant site is collected and pumped to the secondary-treated wastewater storage ponds of the plant, a Stormwater Pollution Prevention Plan has not been made a requirement of this Order.

RECLAMATION

62. Wastewater is currently used to irrigate 210 acres of agricultural land owned by the City of Manteca, and 150 acres of leased land owned by Dutra Farms. DHS has established statewide reclamation criteria in Title 22, California Code of Regulations, Section 60301, et seq. (hereafter Title 22) for the use of reclaimed water, and has developed guidelines for specific uses. This Order requires compliance with applicable Title 22 requirements.

PRETREATMENT

63. Clean Water Act Section 307(b) and Federal Regulations at 40 CFR Part 403 require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants that will interfere with treatment plant operations or sludge disposal and prevent pass through of pollutants that exceed water quality objectives, standards, or permit limitations. Federal Regulation (40 CFR 403.8) requires the Discharger to develop and submit for approval by the Regional Board an acceptable industrial pretreatment program.

64. The Discharger submitted a draft pretreatment program to the Regional Board for approval. The Regional Board, in an October 2001 Pretreatment Audit, identified areas of the program that are deficient or not implemented. The Regional Board staff, on 22 January 2003, provided comments to the Discharger identifying provisions of the City's Waste Ordinance and the Interjurisdictional Agreement between the City of Manteca and the Lathrop County Water District that are deficient. This Order provides a compliance schedule for the Discharger to submit a pretreatment program that corrects the deficiencies noted in the October 2001 Pretreatment Compliance Audit and in the 22 January 2003 letter. The Regional Board will reopen this Order to approve the pretreatment program upon submittal of a program that corrects the deficiencies. Certain areas of the pretreatment program have not been fully implemented pending approval of the program. This Order requires full compliance with all pretreatment program requirements by **1 October 2004**.

OTHER

65. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

66. The discharge is presently governed by Waste Discharge Requirements Order No. 5-01-007, adopted by the Regional Board on 26 January 2001. The discharge of biosolids is also presently governed by Waste Discharge Requirements Order No. 92-052, adopted by the Regional Board on 27 March 1992.

67. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

68. The City of Manteca has certified a final environmental impact report (EIR) in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), and the State CEQA Guidelines.

    The Regional Board has considered the EIR and, after review of the available data, finds significant impacts to water quality could occur after the proposed expansion. However, these waste discharge requirements will avoid the significant impacts on water quality by: (a)

reducing BOD, TSS, pathogen and metals concentrations with the addition of tertiary level treatment, (b) reducing ammonia, nitrate and nitrite with the additions of nitrification and denitrification treatment, (c) mitigating the thermal impacts by discharging treated wastewater on outgoing tides only, and (d) reducing the salinity of the discharge through the implementation of pollution prevention measures or treatment.

69. The Regional Board has considered the information in the Information Sheet in developing the Findings of this Order. The Information Sheet is included as Attachment A and is a part of this Order.

70. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

71. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

72. This Order shall serve as an NPDES permit pursuant to Clean Water Act Section 402, and amendments thereto, and shall take effect upon the date of hearing, provided USEPA has no objections.

IT IS HEREBY ORDERED that Order No. 5-01-007 and Order No. 92-052 are rescinded and the City of Manteca, the City of Lathrop and Dutra Farms, its agents, successors and assigns, in order to meet the provisions contained in California Water Code Division 7 and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in California Water Code Section 13050.

B. Effluent Limitations (Discharge to the San Joaquin River):

1. Effective immediately, and through 31 March 2004, the effluent concentrations and mass loadings shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
BOD[1]	mg/l	20[2]	30[2]	---	50[2]
	lb/day[3]	1160	1740	---	2900
Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Total Suspended Solids	mg/l	20[2]	30[2]	---	50[2]
	lb/day[3]	1160	1740	---	2900
Total Coliform	MPN/100ml	---	23[4]	---	500
Settleable Solids	ml/l	0.1	---	---	0.2
Chlorine Residual	mg/l	---	0.01[5]	0.02	---
Oil and Grease	mg/l	10	---	---	15
	lb/day[3]	580	---	---	870
Aluminum[6]	ug/l	71	---	---	140
	lb/day[3]	4.1	---	---	8.1
Electrical Conductivity	umhos/cm	1000	---	---	---
Ammonia (June-Sept)	mg N/l	2.1	---	---	4.4
	lb/day[3]	120	---	---	260
Ammonia (Oct-May)	mg N/l	2.8	---	---	5.6
	lb/day[3]	160	---	---	320
Arsenic	ug/l	10	---	---	---
	lb/day[3]	0.58	---	---	---
Copper	ug/l	7.9	---	---	10.4
	lb/day[3]	0.46	---	---	0.60
Cyanide	ug/l	3.7	---	---	10
	lb/day[3]	0.21	---	---	0.58
Iron	ug/l	300	---	---	---
	lb/day[3]	17	---	---	---
Manganese	ug/l	50	---	---	---
	lb/day[3]	2.9	---	---	---

Methylene blue active substances (MBAS)	ug/l	500	---	---	---
	lb/day[3]	29	---	---	---
Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Nitrate (as N)	mg/l	10	---	---	---
	lb/day[3]	580	---	---	---
Nitrite (as N)	mg/l	1	---	---	---
	lb/day[3]	58	---	---	---
Bis(2-ethylhexyl) phthalate	ug/l	22	---	---	44
	lb/day[3]	1.3	---	---	2.6
Bromodichloromethane	ug/l	5	---	---	8
	lb/day[3]	0.29	---	---	0.46
Dibromochloromethanee	ug/l	1.4	---	---	2.8
	lb/day[3]	0.08	---	---	0.16
Mercury	ug/l	---	---	---	---
	lb/year	0.69	---	---	---
2,4,6-Trichlorophenol	ug/l	34	---	---	69
	lb/day[3]	2	---	---	4

1 5-day, 20°C biochemical oxygen demand (BOD)
2 To be ascertained by a 24-hour composite
3 Based upon a design treatment capacity of 6.95 mgd.
4 Weekly median
5 Expressed as a 4-day average
6 The Discharger may conduct a water effect ratio study to develop a site-specific objective, and upon adoption and approval of a Basin Plan amendment, the permit may be reopened and the aluminum limitation reconsidered.

2. Effective 1 April 2004, and through 31 January 2009, the effluent concentrations and mass loadings shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
BOD[1]	mg/l	20[2]	30[2]	---	50[2]

	lb/day[3]	1350	2030	---	3380
Total Suspended Solids	mg/l	20[2]	30[2]	---	50[2]
	lb/day[3]	1350	2030	---	3380

Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Total Coliform	MPN/100ml	---	23[4]	---	500
Settleable Solids	ml/l	0.1	---	---	0.2
Chlorine Residual	mg/l	---	0.01[5]	0.02	---
Oil and Grease	mg/l	10	---	---	15
	lb/day[3]	680	---	---	1010
Aluminum[6]	ug/l	71	---	---	140
	lb/day[3]	4.8	---	---	9.5
Electrical Conductivity (1 April to31 August)	umhos/cm	700[7]	---	---	---
Electrical Conductivity (1 Sept to 31 March)	umhos/cm	1000[7]	---	---	---
Ammonia (June-Sept)	mg N/l	2.1	---	---	4.4
	lb/day[3]	140	---	---	300
Ammonia (Oct-May)	mg N/l	2.8	---	---	5.6
	lb/day[3]	190	---	---	380
Arsenic	ug/l	10	---	---	---
	lb/day[3]	0.68	---	---	---
Copper	ug/l	7.9	---	---	10.4
	lb/day[3]	0.53	---	---	0.70
Cyanide	ug/l	3.7	---	---	10
	lb/day[3]	0.25	---	---	0.68
Iron	ug/l	300	---	---	---
	lb/day[3]	20	---	---	---
Manganese	ug/l	50	---	---	---
	lb/day[3]	3.4	---	---	---

Methylene blue active substances (MBAS)	ug/l	500	---	---	---
	lb/day[3]	34	---	---	---

Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Nitrate (as N)	mg/l	10	---	---	---
	lb/day[3]	680	---	---	---
Nitrite (as N)	mg/l	1	---	---	---
	lb/day[3]	68	---	---	---
Bis(2-ethylhexyl) phthalate	ug/l	22	---	---	44
	lb/day[3]	1.5	---	---	3
Bromodichloromethane	ug/l	5	---	---	8
	lb/day[3]	0.34	---	---	0.54
Dibromochloromethanee	ug/l	1.4	---	---	2.8
	lb/day[3]	0.095	---	---	0.19
Mercury	ug/l	---	---	---	---
	lb/year	0.69	---	---	---
2,4,6-Trichlorophenol	ug/l	34	---	---	69
	lb/day[3]	2.3	---	---	4.7

1 5-day, 20°C biochemical oxygen demand (BOD)
2 To be ascertained by a 24-hour composite
3 Based upon a design treatment capacity of 8.11 mgd.
4 Weekly median
5 Expressed as a 4-day average
6 The Discharger may conduct a water effect ratio study to develop a site-specific objective, and upon adoption and approval of a Basin Plan amendment, the permit may be reopened and the aluminum limitation reconsidered.
7 State Water Resources Control Board Decision 1641 requires that the 1000 umhos/cm objective be met year round until 1 April 2005 at which time the seasonal objectives will be effective.

3. Effective 1 February 2009, the effluent concentrations and mass loading shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
BOD[1]	mg/l	10[2]	20[2]	---	30[2]
	lb/day[3]	820	1650	---	2470
Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Total Suspended Solids	mg/l	10[2]	20[2]	---	30[2]
	lb/day[3]	820	1650	---	2470
Total Coliform	MPN/100ml	---	2.2[4]	---	23/240[5]
Turbidity	NTU	---	---	2[6]	5/10[7]
Settleable Solids	ml/l	0.1	---	---	0.2
Chlorine Residual	mg/l	---	0.01[8]	0.02	---
Oil and Grease	mg/l	10	---	---	15
	lb/day[3]	820	---	---	1230
Aluminum[9]	ug/l	71	---	---	140
	lb/day[3]	5.8	---	---	12
Electrical Conductivity (1 April to31 August)	umhos/cm	700	---	---	---
Electrical Conductivity (1 Sept to 31 March)	umhos/cm	1000	---	---	---
Ammonia (June-Sept)	mg N/l	2.1	---	---	4.4
	lb/day[3]	170	---	---	360
Ammonia (Oct-May)	mg N/l	2.8	---	---	5.6
	lb/day[3]	230	---	---	460
Arsenic	ug/l	10	---	---	---
	lb/day[3]	0.82	---	---	---
Copper	ug/l	7.9	---	---	10.4
	lb/day[3]	0.65	---	---	0.86
Cyanide	ug/l	3.7	---	---	10
	lb/day[3]	0.30	---	---	0.82
Iron	ug/l	300	---	---	---

	lb/day[3]	25	---	---	---
Manganese	ug/l	50	---	---	---
	lb/day[3]	4.1	---	---	---
Constituents	Units	Monthly Average	Weekly Average	1- Hour Average	Daily Maximum
Methylene blue active substances (MBAS)	ug/l	500	---	---	---
	lb/day[3]	41	---	---	---
Nitrate (as N)	mg/l	10	---	---	---
	lb/day[3]	820	---	---	---
Nitrite (as N)	mg/l	1	---	---	---
	lb/day[3]	82	---	---	---
Bis(2-ethylhexyl) phthalate	ug/l	22	---	---	44
	lb/day[3]	1.8	---	---	3.6
Bromodichloromethane	ug/l	5	---	---	8
	lb/day[3]	0.41	---	---	0.66
Dibromochloromethane	ug/l	1.4	---	---	2.8
	lb/day[3]	0.12	---	---	0.23
Mercury	ug/l	---	---	---	---
	lb/year	0.69	---	---	---
2,4,6-Trichlorophenol	ug/l	34	---	---	69
	lb/day[3]	2.8	---	---	5.7

1 5-day, 20°C biochemical oxygen demand (BOD)
2 To be ascertained by a 24-hour composite
3 Based upon a design treatment capacity of 9.87 mgd.
4 Weekly median
5 Does not exceed 23 in more than one sample in any 30-day period. No sample shall exceed 240.
6 Does not exceed an average of 2 NTU within a 24-hour period.
7 Does not exceed 5 NTU more than 5 percent of the time within a 24-hour period and 10 NTU at any time.
8 Expressed as a 4-day average
9 The Discharger may conduct a water effect ratio study to develop a site-specific objective, and upon adoption and approval of a Basin Plan amendment, the permit

may be reopened and the aluminum limitation reconsidered.

4. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

5. The discharge shall not have a pH less than 6.5 nor greater than 8.0.

6. Effective immediately, the 30-day average dry weather discharge flow shall not exceed 6.95 million gallons per day, less the amount disposed on land at agronomic rates.

7. Effective 31 March 2004, and pursuant to compliance with effluent ammonia limitations, the 30-day average dry weather discharge flow shall not exceed 8.11 million gallons per day, less the amount disposed on land at agronomic rates.

8. Effective 1 February 2009, and in compliance with Provisions 1 and 4, the 30-day average dry weather discharge flow shall not exceed 9.87 million gallons per day, less the amount disposed on land at agronomic rates, and all discharges shall be on out-going tides only.

9. The peak wet weather discharge flow shall not exceed 13 mgd.

10. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

    Minimum for any one bioassay - - - - - - - - - 70%
    Median for any three or more consecutive bioassays - - - - 90%

11. The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

12. The total annual mass discharge of mercury shall not exceed 0.69 lbs per year. This interim performance-based limitation shall be in effect until final TMDL is established for mercury. The procedures for calculating mass loadings are as follows:
    a. The total pollutant mass load for each individual month shall be determined using an average of all concentration data collected that month and the corresponding average monthly flow. All monitoring data collected under the monitoring and reporting program, pretreatment program and any special studies shall be used for these calculations.
    b. In calculating compliance, the Discharger shall count all non-detect measures at one-half of the detection level. If compliance with the effluent limitation is not attained due to the non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance shall be evaluated with consideration of the detection limits.

c. The Discharger shall submit a cumulative total of mass loadings for the most recent twelve months in accordance with the MRP No. R5-2004-0028.

If mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted, this Order shall be reopened and the mass effluent limitation shall be modified (higher or lower) or an effluent concentration limitation imposed. If the Regional Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for the Discharger.

C. Discharge Specifications (Land Disposal):

1. Discharge of recycled water to surface water or surface water drainage courses is prohibited.

2. The discharge shall be kept within the designated reclamation area, as shown on Figure 2, at all times.

3. The use of reclaimed water shall be limited to surface irrigation of fodder, fiber, or seed crops. Irrigated crops shall not be used for human consumption (either direct or indirect). Additional reclamation uses may be approved by the Executive Officer.

4. Reclaimed water use shall meet the criteria contained in Title 22 California Code of Regulations, Division 4, Section 60301 et. seq.

5. Application of reclaimed water shall be at agronomic rates considering the crop, soil, climate, and irrigation management system. The nutrient loading of the disposal area, including the nutritive value of organic and chemical fertilizers, applied biosolids, and of the reclaimed water, shall not exceed the crop demand.

6. Reclaimed water shall be managed to minimize erosion, runoff, and movement of aerosols from the disposal area.

7. Direct or windblown spray shall be confined to the designated disposal area and prevented from contacting drinking water facilities.

8. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas.

9. The discharge of domestic effluent to the reclamation area shall not exceed the following limits:

Constituent	Units	Monthly Average	Daily Maximum

BOD_5[1]	mg/l	30	45
Settleable Solids	ml/l	0.2	0.5

[1] Five-day, 20° Celsius biochemical oxygen demand.

10. There shall be no standing water in the disposal area 48 hours after wastewater is applied.

11. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

12. Areas irrigated with reclaimed water shall be managed to prevent breeding of mosquitoes. More specifically,

    a. Tail water must be returned and all applied reclaimed water and any additional supplement irrigation water must infiltrate completely within a 48-hour period.

    b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.

    c. Low pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store reclaimed water.

13. Stormwater runoff from the irrigation field shall not be discharged to any surface water drainage course within 30 days of the last application of reclaimed water.

14. There shall be no irrigation or impoundment of reclaimed water within 150 feet of any domestic water well.

15. All reclaimed water equipment, pumps, piping, valves, and outlets shall be appropriately marked to differentiate them from potable facilities, and these shall be of a type, or secured in a manner, that permits operation by authorized personnel only.

16. Conspicuous warning signs indicating that reclaimed water is in use shall be posted at least every 500 feet, with a minimum of a sign at each corner of the parcels and at access road entrances.

17. Supplementing reclaimed water by connection with a domestic drinking water source or irrigation or industrial wells requires an air gap separation device.

18. Neither the treatment nor the use of reclaimed water shall cause a pollution or nuisance as defined by California Water Code Section 13050.

D. Pond Discharge Specifications (Land Disposal):

1. Objectionable odors originating at the facility shall not be perceivable beyond the limits of the disposal areas or property owned by the Discharger.

2. As a means of discerning compliance with Pond Discharge Specification D.1, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/l.

3. Ponds shall not have a pH less than 6.5 or greater than 9.0. Subject to approval of the Executive Officer, lined ponds shall not have a pH less than 6.5 or greater than 10.0.

4. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

   a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.

   b. Weeds shall be minimized.

   c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

5. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the nonirrigation season. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns. Freeboard shall never be less than two feet (measured vertically to the lowest point of overflow).

E. Biosolids Disposal:

1. Collected screenings, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27 California Code of Regulations, Division 2, Subdivision 1, Section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.

2. Any proposed change in biosolids use or disposal practice from a previously approved practice shall be reported to the Executive Officer and USEPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage biosolids shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

If the State Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

4. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

5. The discharger shall comply with the attached Monitoring and Reporting Program No. R5-2004-0028 biosolids monitoring requirements.

On-site Biosolids Disposal Limitations:

6. The discharge of tailwater or field runoff within 30 days after application of biosolids is prohibited for application areas where biosolids has not been incorporated into the soil and there is not sufficient vegetation in the application area and along the path of runoff to prevent movement of biosolids particles from the application site.

7. The direct or indirect discharge of biosolids to surface waters or surface water drainage course is prohibited.

8. The discharge of waste classified as "hazardous" or "designated" as defined in Title 23, California Code of Regulations, Section 2521 (a) and Section 2522 (a), is prohibited.

9. The onsite application of biosolids at rates in excess of the nitrogen requirements of the vegetation or at rates that would cause the excess nitrogen or metals to leach to ground water, is prohibited. All sources (wastewater, fertilizers, biosolids) of nitrogen and metals to the application area must be included in the analysis of the total loading rate.

10. The onsite discharge of biosolids with pollutant concentrations greater than those shown below is prohibited:

Constituent	Ceiling Concentration Mg/kg dry weight
Arsenic	75
Cadmium	85
Chromium	3000
Copper	4300
Lead	840
Mercury	57
Nickel	420
Selenium	100
Zinc	7500

11. Biosolids shall not be applied to land subject to erosion during a flood, or having a surface slope in excess of fifteen percent.

12. Biosolids shall comply with either Class A or Class B pathogen reduction standards as listed in 40 CFR 503.

13. Biosolids shall comply with one of the Vector Attraction Reduction standards as listed in 40 CFR 503.33.

14. Biosolids shall not be applied to land in amounts which cause the following lifetime cumulative loading rates to be exceeded:

Cumulative Loading Rates

Constituent	kg/hectare	lbs./acre
Arsenic	41	37
Cadmium	39	35
Chromium	3000	2672
Copper	1500	1336
Lead	300	267
Mercury	17	15
Molybdenum	18	16
Nickel	420	374
Selenium	100	89
Zinc	2800	2494

15. Biosolids shall not be deposited to flooded, frozen or water-saturated ground, or during periods of heavy rainfall.

16. Objectionable odor originating at this facility shall not be perceivable beyond the limits o the property owned or controlled by the discharger.

17. Staging areas and biosolids application shall be at least:

    a. 10 feet from property lines.
    b. 500 feet from domestic water supply wells.
    c. 50 feet from non-domestic water supply wells.
    d. 20 feet from public roads.
    e. 100 feet from surface waters.
    f. 100 feet from residential buildings.

18. After the last application of biosolids in each field, the Discharger shall ensure the following:

    a. For at least 30 days:
        (1) Public access to the application area is restricted;
        (2) Feed and fiber crops are not harvested; and

(3) Animals do not graze on the land.

b. For at least 12 months:
(1) Turf is not harvested if turf is placed on land with a high degree of public exposure: and
(2) If the field is used as pasture, grazing by milking animals is prevented.

c. For at least 14 months:
(1) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface are not harvested.

d. For at least 38 months:
(1) Food crops with harvested parts below the land surface are not harvested; and
(2) If the field is used as pasture, grazing of milking animals used for producing unpasteurized milk for human consumption is prevented.

Biosolids Storage Specifications

19. Facilities for the storage of Class B biosolids shall be located, designed and maintained to restrict public access to biosolids.

20. Biosolids storage facilities shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.

21. Biosolids storage facilities, which contain biosolids, shall be designed and maintained to contain all storm water falling on the biosolids storage area during a rainfall year with a return frequency of 100 years.

22. Biosolids storage facilities shall be designed, maintained and operated to minimize the generation of leachate.

F. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 5 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95^{th} percentile concentration shall not fall below 75 percent of saturation.

2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

4. Esthetically undesirable discoloration.

5. Fungi, slimes, or other objectionable growths.

6. The turbidity to increase as follows:

    a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

    c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

7. The ambient pH to fall below 6.5, exceed 8.5, or the 30-day average ambient pH change by more than 0.5 units.

8. The creation of a zone, defined by water temperatures of more than $1^{o}F$ above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point.

9. A surface temperature rise greater than $4^{o}F$ above the natural temperature of the receiving water at any time or place.

10. Deposition of material that causes nuisance or adversely affects beneficial uses.

11. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in Title 22, California Code of Regulations; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

12. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

13. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

14. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Board pursuant to the Clean Water Act and regulations adopted thereunder.

15. Taste or odor-producing substances to impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

G. Groundwater Limitations:

Discharge of waste constituents from any storage, treatment, or disposal component associated with the WQCF shall not, in combination with other sources:

1. Adversely impact beneficial uses of the groundwater or exceed water quality objectives.

2. Cause any waste constituent concentration, when compared with background, to be incrementally increased above the current concentration in down-gradient wells.

3. Cause total coliform organisms to equal or exceed a most probable number of 2.2/100 ml over any seven-day period.

H. Provisions:

1. By **1 February 2009**, wastewater discharged to the San Joaquin River shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the DHS reclamation criteria, Title 22 California Code of Regulations, Division 4, Chapter 3, (Title 22) or equivalent. The Discharger shall comply with the following time schedule to assure compliance with the limitations for BOD, total suspended solids, total coliform and turbidity contained in Effluent Limitations B.3 of this Order:

Task	Compliance Date	Report Due Date
Submit Annual Status Report		**1 June, annually**
Submit Workplan/Time Schedule		**1 September 2004**
Full Compliance	**1 February 2009**	

The Discharger shall submit to the Regional Board on or before each compliance and report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated; the report shall also include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

2. Pursuant to Title 22 Section 60323, the Discharger shall prepare a Title 22 Engineer's Report that reflects the proposed reclamation uses and operation. The report shall be prepared in accordance with DHS guidelines, as listed in Attachment C. The report shall be submitted to DHS and the Regional Board for review and approval. The report shall be completed in conformance with the following schedule.

Task	Compliance Date
Submit Workplan and Time Schedule	**1 May 2004**
Submit Draft Report	**1 August 2005**
Submit Final Report	**1 January 2006**

The Discharger shall submit to the Board, on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

3. In accordance with California Business and Professions Code Sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain the professional's signature and/or stamp of the seal.

4. The discharger has requested an expansion of allowable flows being discharged to the San Joaquin River. Effluent limitation B.8 allows the flows to increase to 9.87 mgd pending completion of the following by the Discharger, and approval by the Executive Officer:

   a. The discharger shall install a monitoring station in the receiving water in the vicinity of the outfall adequate to provide real-time monitoring of receiving water flows.
   b. The discharger shall demonstrate the ability to store effluent and discharge to surface waters only on out-going tides. The demonstration shall document adequate storage capacity, and operations procedures to reliably implement this discharge strategy.
   c. The Discharger shall implement adequate measures to comply with Effluent Limitations under B.3.
   d. The discharger shall implement adequate measures to comply with Effluent Limitation B.11 and Receiving Water Limitations F.8 and F.9 or shall have obtained exceptions to the Thermal Plan.

5. There are indications that elevated temperatures in the San Joaquin River may affect migrating Chinook salmon and other fish during portions of the year. Temperature objectives in the Basin Plan and the Thermal Plan may not address the temperature parameters necessary to protect migrating fish. To evaluate the effect of a thermal temperature discharge to migrating fish, the Discharger shall conduct a comprehensive study of the effect of its thermal discharge to migrating fish in the vicinity of the discharge (with particular attention being paid to those periods when River flow is lowest and/or River or effluent temperature are highest). The Discharger shall perform the study in consultation with the Department of Fish and Game, United States Environmental Protection Agency, National Marine Fisheries Service, United States Fish and Wildlife Service, and other interested parties.

   A work plan for this study shall be completed and submitted to the Executive Officer by **1 September 2004**. The work plan shall include a schedule for completing all work in accordance with the work plan within eighteen **(18) months** following work plan approval by the Executive Officer. Also, a progress report shall be submitted every **six (6) months** after approval of the work plan. The permit may be reopened after review of the study to incorporate Regional Board findings and requirements as appropriate.

6. *Pollution Prevention Plan*: The Discharger shall prepare a pollution prevention plan following California Water Code 13263.3(d)(3) for mercury. A work plan and time schedule for preparation of the pollution prevention plan shall be completed and submitted to the Executive Officer for approval by **1 August 2004**. The Pollution Prevention Plan shall be completed and submitted to the Regional Board by **1 August 2005**. A progress report shall be submitted every **six (6) months** after submittal of the work plan. Based on a review of the submitted information, this Order may be reopened for addition and/or modification of limitations and requirements for these constituents.

   The Discharger shall submit to the Regional Board, on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

7. *SIP Study*: The discharge may contain dioxins that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of these constituents potential effect in surface waters:

Task	Compliance Date
Submit Study Report for Dioxins	**1 November 2004**

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order will be reopened and effluent limitations added for the subject constituents.

The Discharger shall submit to the Regional Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

8. To determine compliance with the Groundwater Limitations, the groundwater monitoring network shall include one or more background monitoring wells and a sufficient number of designated monitoring wells downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater. All monitoring wells shall comply with the appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or County pursuant to California Water Code Section 13801.

   The Discharger, after one year of monitoring, shall characterize natural background quality of monitored constituents in a technical report, to be submitted by **1 May 2005**. For each groundwater monitoring parameter/constituent identified in the Monitoring and Reporting Program, the report shall present a summary of monitoring data, calculation of the concentration in background monitoring wells, and a comparison of background groundwater quality to that in wells used to monitor the facility. Determination of background quality shall be made using the methods described in Title 27 California Code of Regulations Section 20415(e)(10), and shall be based on data from at least four consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare measured concentrations for compliance monitoring wells with the calculated background concentration.

   If the monitoring shows that any constituent concentrations are increased above background water quality, the Discharger shall submit a technical report describing the evaluations results and critiquing each evaluated component with respect to BPCT and minimizing the discharge's impact on groundwater quality. In no case shall the discharge be allowed to exceed a water quality objective. This Order may be reopened and additional groundwater limitations added.

9. By **31 March 2006**, the Discharger shall submit a *Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan* (SSS Plan) that describes the actions designed to prevent, or minimize the potential for sanitary sewer overflows. The Discharger shall maintain the SSS Plan in an up-to-date condition and shall amend the SSS Plan whenever there is a change (e.g. in the design, construction, operation, or maintenance of the sanitary sewer system or sewer facilities) that materially affects the potential for

sanitary sewer overflows, or whenever there is a sanitary sewer overflow. The Discharger shall ensure that the up-to-date SSS Plan is readily available to sewer system personnel at all times and that sewer system personnel are familiar with it. A general order to regulate collection systems may be developed by the Regional Board. If a general order for collection systems is adopted by the Regional Board, the Discharger will be required to seek coverage under the general order. Once the Discharger has obtained a general order for the collection system, this permit may be reopened and these requirements may be removed from this permit.

a. At a minimum, the Operation and Maintenance portion of the plan shall contain or describe the following:

    1. Detailed maps of the sanitary sewer system, identifying sewer mains, manholes, and lift stations;

    2. A detailed listing of elements to be inspected, a description of inspection procedures and inspection frequency, and sample inspection forms;

    3. A schedule for routine inspection and testing of all pipelines, lift stations, valves, and other key system components. The inspection/testing program shall be designed to reveal problems that might lead to accidental spills and ensure that preventive maintenance is completed;

    4. Provisions for repair or replacement of old, worn out, or defective equipment;

    5. Provisions to minimize the need for manual operation of critical systems and provide spill alarms or other “fail safe” mechanisms;

    6. The ability to properly manage, operate and maintain, at all times, all parts of the collection system that the Discharger owns or over which the Discharger has operational control;

    7. The ability to provide adequate capacity to convey base flows and peak flows for all parts of the collection system the Discharger owns or over which the Discharger has operational control; and

    8. How the Discharger will take all feasible steps to stop and mitigate the impact of sanitary sewer overflows in portions of the collection system the Discharger owns or over which the Discharger has operational control.

b. At a minimum, the Overflow Prevention and Response Plan shall contain or describe the following:

    1. Identification of areas of the collection system that historically have overflowed and an evaluation of the cause of the overflow;

2. Maintenance activities that can be implemented to address the cause of the overflow and means to prevent future overflows. Maintenance activities may include pretreatment of wastewater from industrial dischargers who discharge high concentrations of oil and grease in their wastewater;

3. Procedures for responding to sanitary sewer overflows designed to minimize the volume of sewer overflow that enters surface waters, and minimize the adverse effects of sewer overflows on water quality and beneficial uses;

4. Steps to be taken when an overflow or spill occurs, and procedures that will be implemented to ensure that all overflows and spills are properly identified, responded to and reported; and

5. A public notification plan, in which any posting of areas contaminated with sewage is performed at the direction of the Sacramento County Health Department. All parties with a reasonable potential for exposure to an overflow event shall be notified.

10. The land leased from Dutra Farms may become unavailable for land disposal over the term of this Order. The Discharger shall provide a technical report by **1 August 2004** that assesses the land disposal capacity of City-owned land covered by this Order, to agronomically apply food processing wastewater, biosolids, and a portion of the municipal wastewater in compliance with this Order. If the Discharger cannot demonstrate that adequate capacity is available for, at a minimum, all food processing wastewater and all biosolids, then the report shall include plans and a time schedule to provide adequate capacity or determine an alternative disposal solution (e.g. landfill disposal of biosolids) in the event the lease is terminated.

11. The Discharger shall conduct the three species chronic toxicity testing as specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Board, this Order may be reopened and a limitation based on that objective included.

12. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

13. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

14. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

15. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated February 2004, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

16. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0028, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

    When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

17. In order to comply with Effluent Limitations and Discharge Specifications for Land Disposal, the Discharger shall submit 120 days in advance of the upgraded plant start-up, a technical report for the maximization of land disposal of wastewater at agronomic rates, which specifies:

    a. Crop types to be used and their associated water and nutrient uptake rates;

    b. Seasonal wastewater and sludge application rates based on hydraulic capacity (monthly water balance), BOD removal capacity, nutrient uptake rates, and heavy metal accumulated rates; and

    c. Application and runoff control techniques.

18. The DO TMDL completion date is anticipated to be in 2004. This Order may be reopened to consider alternative effluent limitations (including but not limited to: BOD, CBOD, ammonia, and TSS) needed to allow the Discharger to meet it’s required load allocation that may be specified in the TMDL.

19. This Order expires on 1 March 2009 and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

20. The Discharger shall enforce the Pretreatment Standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including but not limited to:

    a. Adopting the legal authority required by 40 CFR 403.8(f)(1);

    b. Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

    c. Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

    d. Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

21. The Discharger shall submit to the Regional Board by **31 May 2004** a revised pretreatment program that corrects, to the satisfaction of the Regional Board, the deficiencies noted in the October 2001 Pretreatment Audit and the 22 January 2003 letter from the Regional Board staff. Upon submittal of an adequate revised pretreatment program, the Regional Board will reopen this Order to approve the pretreatment program. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Board, the State Board or the USEPA may take enforcement actions against the Discharger as authorized by the Clean Water Act. The pretreatment program has not previously been fully implemented. The Discharger shall be in full compliance with all pretreatment program requirements by **1 October 2004**, and shall submit a report by **1 November 2004** that outlines actions taken to implement the program.

22. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

    a. Wastes that create a fire or explosion hazard in the treatment works;

    b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

    c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

    d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Board approves alternate temperature limits;

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.

23. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

    a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

    b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

24. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Board (Division of Water Rights).

25. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

    To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 19 March 2004.

THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0028

NPDES NO. CA0081558

FOR
CITY OF MANTECA, CITY OF LATHROP AND DUTRA FARMS
WASTEWATER QUALITY CONTROL FACILITY
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Sections 13383 and 13267. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
20°C BOD_5	mg/l, lbs/day	24 hr. Composite	Daily
Suspended Solids	mg/l, lbs/day	24 hr. Composite	Daily
Flow	mgd	Meter	Continuous

EFFLUENT MONITORING
(When discharging to Surface Waters)

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and quality of the discharge. Samples collected from the outlet structure of ponds will be considered adequately composited. The date and time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
Flow	mgd	Meter	Continuous

Constituents	Units	Type of Sample	Sampling Frequency
Temperature[1]	°F	Meter	Continuous
Chlorine Residual[2]	mg/l	Continuous	Continuous
PH	Number	Grab	Daily
Total Coliform Organisms	MPN/l00 ml	Grab	Daily
20°C BOD_5	mg/l, lbs/day	24 hr. Composite	Daily
Suspended Solids	mg/l, lbs/day	24 hr. Composite	Daily
Settleable Solids	ml/l	Grab	Daily
Turbidity	NTU	Grab	Daily
Ammonia[3,4]	mg/l	Grab	Weekly
Nitrate	mg/l	Grab	Weekly
Nitrite	mg/l	Grab	Weekly
Total Dissolved Solids	mg/l	Grab	Monthly
Electrical Conductivity @25°C	umhos/cm	Grab	Monthly
Acute Toxicity[5,6,7]	% Survival	Grab	Monthly
Aluminum, total	ug/l	Grab	Monthly
Arsenic, total[8]	ug/l	Grab	Monthly
Copper, total[8]	ug/l	Grab	Monthly
Cyanide, total[8]	ug/l	Grab	Monthly
Iron, total	ug/l	Grab	Monthly
Manganese, total	ug/l	Grab	Monthly
MBAS	ug/l	Grab	Monthly
Mercury, total[9]	ug/l	Grab	Monthly
Molybdenum	ug/l	Grab	Monthly
Trihalomethanes[8,10]	ug/l	Grab	Monthly
2,4,6-Trichlorophenol[8]	ug/l	Grab	Monthly
Bis(2-ethylhexyl)phthalate[8]	ug/l	Grab	Monthly

Constituents	Units	Type of Sample	Sampling Frequency
Carbofuran	ug/l	Grab	Quarterly
Standard Minerals[11]	mg/l	Grab	Annually
Priority Pollutants[8,12]	mg/l	Grab	Annually

1 Effluent temperature monitoring will be at the outfall location.
2 Chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/l.
3 Concurrent with biotoxicity monitoring.
4 Report as total.
5 The acute bioassays samples shall be analyzed using EPA-821-R-02-012, Fifth Edition, or later amendment with Regional Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (Pimephales promelas), with no pH adjustment unless approved by the Executive Officer.
6 Concurrent with Ammonia Sampling.
7 The bioassay may be modified to eliminate ammonia-related toxicity until 31 March 2004, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity.
8 Detection limits will be equal to or less than the lowest minimum level published in Appendix 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP).
9 Utilize Method 1631 with a detection limit of 0.0005 ug/l.
10 Trihalomethanes include bromoform, chloroform, bromodichloromethane, and dibromochloromethane.
11 Standard minerals shall include all major cations and anions and include a verification that the analysis is complete (i.e., cation/anion balance).
12 Concurrent with receiving water sampling.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

EFFLUENT MONITORING OF RECLAMATION WATER

Effluent samples shall be collected downstream from the last connection through which reclaimed water can be admitted into the field distribution system. Effluent samples should be representative of the volume and nature of the discharge. Samples collected from the outlet structure of ponds will be

considered adequately composited. The date and time of collection of a grab sample shall be recorded. The following shall constitute the effluent monitoring program:

Constituent	Units	Type of Sample	Sampling Frequency
Flow	MGD	Continuous	Daily
20°C BOD_5	mg/l	Grab	Twice Monthly
Settleable Matter	ml/l	Grab	Twice Monthly
Total Dissolved Solids	mg/l	Grab	Quarterly
Electrical Conductivity @25°C	umhos/cm	Grab	Twice Monthly
Ammonia (as N)	mg/l	Grab	Twice Monthly
Nitrate (as N)	mg/l	Grab	Twice Monthly
Total Metals[1]	mg/l	Grab	Annually[2]

[1]Total Metals shall include analyses for Cadmium, Chromium, Copper, Lead, Nickel, and Zinc.
[2]Samples shall be collected during the month of August.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, with the exception of metals analyses, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

STORAGE POND MONITORING

Constituent	Units	Type of Sample	Sampling Frequency
Dissolved Oxygen	mg/l	Grab	Weekly
pH	pH units	Grab	Weekly

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. The date and time will be recorded with each sample. Receiving water monitoring shall include at least the following:

Station	Description
R-l	100 feet upstream from the point of discharge
R-2	500 feet downstream from the point of discharge
R-3	1 mile downstream from the point of discharge
R-4	2 mile downstream from the point of discharge

Constituents	Units	Station	Sampling Frequency
River Flow	cfs	Footnote 1	Continuous[1]
Direction of River Flow		Footnote 1	Continuous[1]
Dissolved Oxygen	mg/l	R-l, R-2, R-3, R-4	Bi weekly[2]
pH	Number	R-l, R-2, R-3, R-4	Bi weekly[2]
Turbidity	NTU	R-l, R-2	Bi weekly[2]
Temperature	°F (°C)	R-1 R-2, R-3, R-4	Continuous Bi weekly[2]
Electrical Conductivity @25°C	umhos/cm	R-1, R-2	Bi weekly[2]
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2	Bi weekly[2]
Ammonia[3]	mg/l	R-l, R-2, R-3, R-4	Bi weekly[2]
Nitrate	mg/l	R-l, R-2	Bi weekly[2]
Nitrite	mg/l	R-l, R-2	Bi weekly[2]
Total Chlorine Residual	mg/l	R-1, R-2	Bi weekly[2]
Aluminum, total	ug/l	R-1, R-2	Quarterly
Arsenic, total[4]	ug/l	R-1, R-2	Quarterly
Copper, total[4]	ug/l	R-1, R-2	Quarterly
Iron, total	ug/l	R-1, R-2	Quarterly
Manganese, total	ug/l	R-1, R-2	Quarterly

Constituents	Units	Station	Sampling Frequency
Mercury, total[5]	ug/l	R-1, R-2	Quarterly
Molybdenum	ug/l	R-1, R-2	Quarterly
Trihalomethanes[4,6]	ug/l	R-1, R-4	Quarterly
2,4,6-Trichlorophenol[4]	ug/l	R-1, R-4	Quarterly
Bis(2-ethylhexyl)phthalate[4]	ug/l	R-1, R-4	Quarterly
Standard Minerals[7]	mg/l	R-1, R-4	Yearly
Priority Pollutants[4,8]	mg/l	R-1, R-4	Yearly

[1] The Discharger shall propose an appropriate location and real-time monitoring equipment to be installed near the outfall for Executive Officer approval. Flow and directional monitoring must be initiated by 1 March 2005.
[2] Samples shall be collected every two weeks when discharging to the receiving water.
[3] Temperature and pH shall be determined at the time of sample collection.
[4] Detection limits will be equal to or less than the lowest minimum level published in Appendix 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan).
[5] Utilize Method 1631 with a detection limit of 0.0005 ug/l.
[6] Trihalomethanes include bromoform, chloroform, bromodichloromethane, and dibromochloromethane.
[7] Standard minerals shall include all major cations and anions and include a verification that the analysis is complete (i.e., cation/anion balance).
[8] Concurrent with effluent sampling.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-l and R-2. Attention shall be given to the presence or absence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Visible films, sheens or coatings
f. Fungi, slimes, or objectionable growths
g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the San Joaquin River. The testing shall be conducted as specified in EPA/821-R-02-013, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, October 2002, or later amendment with Regional Board staff approval. Chronic toxicity samples shall be taken at the effluent monitoring location specified in this Monitoring and Reporting Program. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent. Time of sample collection shall be recorded. The receiving water control shall be obtained immediately upstream of the discharge from an area unaffected by the discharge in the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days.

Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas, Ceriodaphnia dubia,* and *Selenastrum capricornutum*

Frequency: Quarterly

Dilution Series:

	Dilutions (%)					Controls	
	100	50	25	12.5	6.25	Receiving Water	Lab Water
% WWTP Effluent	100	50	25	12.5	6.25	0	0
% Dilution Water[1]	0	50	75	87.5	93.75	0	100
% Receiving Water	0	0	0	0	0	100	0

[1] Dilution water shall be standard laboratory control water due to intermittent receiving water toxicity.

BIOSOLIDS MONITORING

A composite sample of biosolids shall be collected in accordance with USEPA's POTW Biosolids Sampling and Analysis Guidance Document, August 1989, (or most recent edition) and tested for the following constituents:

Constituent	Units	Sample Type	Frequency
Quantity	Dry Tons	--------	Quarterly
Solids Content	% percentage	Composite	Quarterly
Disposal Location	--------	--------	Quarterly
Arsenic	mg/kg	Composite	Quarterly
Cadmium	mg/kg	Composite	Quarterly
Chromium	mg/kg	Composite	Quarterly
Copper	mg/kg	Composite	Quarterly
Lead	mg/kg	Composite	Quarterly
Mercury	mg/kg	Composite	Quarterly
Molybdenum	mg/kg	Composite	Quarterly
Nickel	mg/kg	Composite	Quarterly
Selenium	mg/kg	Composite	Quarterly
Zinc	mg/kg	Composite	Quarterly
Oil and Grease	mg/kg	Composite	Quarterly
Nitrogen	mg/kg (dry)	Composite	Quarterly
Ammonia	mg/kg (dry)	Composite	Quarterly
Nitrate	mg/kg (dry)	Composite	Quarterly
Total Kjeldahl Nitrogen	mg/kg (dry)	Composite	Quarterly
Fecal Coliform	MPN/gram total solids	Composite	See Footnote 1
Priority Pollutants	---	Composite	See Footnote 2

[1] The Discharger shall collect seven composite samples over a two week period each quarter, and analyze the samples for fecal coliform (report as MPN/gm total solids). Results for each sample shall be reported along with the geometric mean of the results.

[2] **Within 90 days of the effective date of this Order, and annually thereafter**, the Discharger shall submit results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). Suggested methods for analysis of biosolids are provided in USEPA publications titled "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" and "Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater". Other guidance is available in USEPA's POTW Biosolids Sampling and Analysis Guidance Document, August 1989 (or most recent edition).

Results of monitoring shall be reported in compliance with the Reporting Section. The biosolids monitoring report shall include a statement concerning compliance with 40 CFR Part 503 biosolids

disposal requirements. The report shall include, but is not limited to, an assessment of cumulative metals and nitrogen loadings from all sources, type of crop grown, nitrogen demand, and setback and runoff compliance, as well as compliance with pathogen reduction and vector attraction reduction standards.

Discharger shall submit annually a description of disposal methods, including the following information related to the disposal methods used at the facility. If more than one method is used, include the percentage of annual biosolids production disposed by each method.

a. For **landfill disposal**, include (1) the Regional Board's WDR numbers that regulate the landfill(s) used, (2) the present classifications of the landfill(s) used, and (3) the names and locations of the receiving facility(ies).

b. For **land application,** include (1) location of the site(s), (2) the Regional Board's WDR numbers that regulate the site(s), (3) the application rate in lbs/year (specify wet or dry), and (4) subsequent uses of the land.

c. For **incineration**, include (1) name and location of the site(s) where sludge incineration occurs, (2) the Regional Board's WDR numbers that regulate the site(s), (3) the disposal method of the ash, and (4) the names and locations of facilities receiving ash (if applicable).

d. For **composting**, include (1) name and location of the site(s) where sludge composting occurs, and (2) the Regional Board's WDR numbers that regulate the site(s).

SOIL PROFILE MONITORING

A minimum of four representative locations shall be established for soil profile sampling of the fields where effluent and sludge are applied. The following shall constitute the monitoring program:

Measurement	Units	Soil Profile	Sampling Frequency
Nitrate Nitrogen	mg/kg	4 feet[1]	Annually[2]
Kjeldahl Nitrogen	mg/kg	4 feet[1]	Annually[2]
Soluble Salts[3]	mg/kg	4 feet[1]	Annually[2]
Total Metals[4]	mg/kg	4 feet[1]	Annually[2]

[1]Samples shall be collected at l-foot increments.

[2]Each location shall be sampled during the month of April.

[3]Soluble salts shall be determined using test methods described in Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties, Second Edition, Edited by Page, Miller and Keeney; American Society of Agronomy, Inc., Soil Science Society of America, Inc.: 1982 Page 168 et seq., or other acceptable test methods with prior approval by the Executive Officer. Analytical results shall report the soil/water ratio.

[4]Total Metals shall include analyses for Cadmium, Chromium, Copper, Lead, Nickel, and Zinc.

GROUNDWATER MONITORING

Prior to construction, plans and specifications for ground water monitoring wells shall be submitted to Regional Board staff for review and approval. Wells shall comply with requirements of the Department of Water Resources. Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until pH and electrical conductivity have stabilized. Samples shall be collected using standard USEPA methods. Groundwater monitoring shall include, at a minimum:

Constituent	Units	Type of Sample	Sample Frequency
Depth to Groundwater[1]	Feet	Measurement	Quarterly
Groundwater Elevation[1]	Feet	Measurement	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly
Ammonia, as Nitrogen	mg/l	Grab	Quarterly
Nitrate, as Nitrogen	mg/l	Grab	Quarterly
PH	pH Units	Grab	Quarterly
Electrical Conductivity[2] @ 25^{o}C	umhos/cm	Grab	Quarterly
Total Coliform Organisms	MPN/100 ml	Grab	Quarterly
Title 22 Metals	mg/l	Grab	Quarterly

[1] Groundwater elevation shall be used to calculate the direction and gradient of groundwater flow. Elevations shall be measured to the nearest one-hundredth of a foot from mean sea level. The groundwater elevation shall be measured prior to purging the wells.

[2] A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. The following shall constitute the water supply monitoring program.

Constituents	Units	Sampling Frequency
Standard Minerals[1]	mg/l	Yearly
Electrical Conductivity[2] @ 25°C	umhos/cm	Yearly
Total Dissolved Solids	mg/l	Yearly

[1] Standard minerals shall include all major cations and anions, including calcium, magnesium, hardness, sodium, potassium, alkalinity, sulfate, chloride, boron, and nitrate, and verification that the analysis is complete (i.e., cation/anion balance).

[2] If the water supply is from more than one source, the EC shall be reported as a weighted average and include copies of supporting calculations.

REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Suspended Solids, should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting

of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).

b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Regional Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

19 March 2004

MWK

INFORMATION SHEET ORDER NO. R5-2004-0028 ATTACHMENT A
CITY OF MANTECA, CITY OF LATHROP AND DUTRA FARMS
WASTEWATER QUALITY CONTROL FACILITY
SAN JOAQUIN COUNTY

1 Introduction

The City of Manteca and City of Lathrop are currently governed by Order No. 5-01-007, NPDES No. CA0081558, adopted 26 January 2001. The City of Manteca has submitted a Report of Waste Discharge for renewal of this Order and for expansion of the wastewater quality control facility (WQCF).

The City of Manteca owns and operates the WQCF that receives wastewater flows from the City of Manteca and some areas of the City of Lathrop. The City of Manteca is responsible for the operation and discharge from the treatment plant, while the City of Lathrop is only responsible for its portion of the wastewater collection system. The City of Manteca leases 150 acres of land from Dutra Farms for application of treated wastewater, therefore Dutra Farms is named in this permit and is responsible for the proper application and management of the wastewater on its land. The City of Manteca, City of Lathrop, and Dutra Farms are hereafter Discharger.

The City's treatment process consists of raw influent bar screening, flow metering, and grit removal, followed by primary sedimentation, biofiltration, conventional activated sludge and secondary sedimentation. Secondary effluent is spread over agricultural fields and the excess flows are chlorinated, dechlorinated and discharged to the San Joaquin River.

The City of Manteca currently discharges an average of 2.0 mgd of treated domestic and industrial wastewater at agronomic rates to 210 acres of farmland owned by the City adjacent to the treatment plant, and 150 additional acres leased by the city with the excess flows discharged to the San Joaquin River. The flows to agricultural land are required to be maximized to limit the discharges to surface waters. Surface water discharges average 4.89 mgd.

The treatment system capacity will be expanded through the addition of primary and secondary treatment units that will be similar to and parallel to the existing units. In addition, nitrification, denitrification, tertiary filtration, and UV disinfection will be added to improve the effluent quality. Only the wastewater that will be discharged to the San Joaquin River will receive tertiary filtration and UV disinfection. The expansion will also include additional sludge digestion and dewatering units, as well as improvements to buildings, pump stations, ponds, and chemical handling. Food processing waste will also be delivered, treated, and land applied separately from the municipal waste collection and treatment system.

2 Dilution

The City of Manteca utilizes a side-bank outfall on the eastern bank of the San Joaquin River. The flow in the San Joaquin River can be estimated from the Vernalis gaging station which is approximately 15 miles upstream of the Manteca outfall. There are agricultural diversions and returns between the Vernalis station and the outfall, which will affect flow and water quality. Additionally, Brown Sand discharges approximately 10 cfs of wastewater made up of primarily groundwater infiltrate from the Oakwood Lake impoundment just 50 feet downstream via a side-bank outfall on the same side of the San Joaquin River as that of Manteca's outfall.

2.1 Available Receiving Water Flow Data

DWR collects daily average flow data for the San Joaquin River near Vernalis at station RSAN112. Evaluation of this data for the period 1980 to 2002 provided a 1Q10 value of 567 cfs, a 7Q10 value of 620 cfs, and a 30Q10 value of 680 cfs. This period was selected because all current flow control structures on the San Joaquin River and its tributaries were in place by 1980. However, the data set may not accurately represent historical critical low flow periods. Table 2 summarizes the flow data and calculations. Stage data collected at the Vernalis station does not indicate any tidal flows this far upstream. Downstream, DWR collects stage data near Mossdale at station RSAN087, near the Manteca outfall. Stage data fluctuated about 0.5 feet daily implying that the tidal flow is present.

Under critical low flow conditions, upstream flows occur on the flood tide, no flow during the slack tide, and downstream flows during the ebb tide. Multiple dosing of the receiving water with effluent may occur as the tide moves the water column upstream and downstream past the outfall. The complex dynamics of the stream flow, the tidal flows, and the intermittent side bank discharges from the City of Manteca and the Brown Sand impoundment must be considered in an evaluation of the available dilution in the immediate area of these side-bank outfalls.

2.2 Available Hydrodynamic/Water Quality Models

Hydrodynamic and water quality models were utilized for the analysis of the water quality impacts of the proposed expansion of the City of Manteca wastewater discharge to the San Joaquin River. Resource Management Associates (RMA) performed the modeling that was published in the *Analysis of the Fate and Water Quality Impacts of the City of Manteca Discharge, Resource Management Associates, October 10, 2000*. Larry Walker Associates utilized the modeling data developed by RMA to generate the *Water Quality Analysis of Surface Water Discharge, Larry Walker Associates, October 2000*. Both of these documents are included in the appendices of the *Draft Environmental Impact Report for the Manteca WQCF Phase III/IV Expansion Project, October 2000*.

The near-field analysis was performed using the RMA-10 model which performed the hydrodynamic simulation and the temperature and ammonia evaluations. The near-field analysis was based on the assumptions that:

1. Minimum daily flows in the San Joaquin River at Vernalis since 1983 were used.
2. Discharge to the river would be only during the out-going tide.
3. Ambient water conditions for temperature and ammonia were based on the DWR-D-1485 site at Mossdale.

The far-field water quality analysis was performed using a link-node hydrodynamic model of the San Joaquin River and Delta. The link-node tidally averaged water quality model simulates the long-term fate and transport of a discharge to the Delta. A total of three Delta configurations were considered for the parameters of dissolved oxygen, total organic carbon, and total dissolved solids. A tracer simulation was utilized to determine the potential influence of the treated effluent on downstream intakes. The model predicts very small changes to downstream locations as a result of the discharge.

The EIR concludes that these small changes are insignificant. The EIR does not evaluate the cumulative impacts of the Manteca discharge.

However, there are concerns about the accuracy of the modeling. The biggest concern is with the lack of a demonstrated calibration of the near-field RMA-10 modeling. Without comparison to field data (e.g. dye or temperature), there is no assurance that plume dimensions or in-stream dilutions are accurate for the Manteca discharge. Dilution and plume dimensions were not determined under critical conditions that have occurred at the outfall. The timed discharge modeling did not appear to be run for an adequate time period to allow the tidal cycles and their recirculation effects to be fully accounted for in the plume development. The Brown Sand, Inc. discharge was not taken into account to determine its effects on plume development.

2.3 Regulatory Guidance for Dilution Credits and Mixing Zones

The Clean Water Act directs states to adopt water quality standards to protect the quality of their waters. USEPA's current water quality standards regulation authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 CFR §122.44 and §122.45). The USEPA allows states to have broad flexibility in designing their mixing zone policies. Primary guidance on determining mixing zone and dilution credits is provided by the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (State Implementation Policy or SIP), the *USEPA Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)* (TSD), and the Basin Plan. For NPDES permits in California, the SIP guidance supercedes the USEPA guidance for priority pollutants, to the extent that it addresses a particular procedure. The SIP does not apply to non-priority pollutants, in which case the more stringent of the Basin Plan or USEPA guidance applies.

The allowance of mixing zones by the Regional Board is discussed in the Basin Plan, Policy for Application of Water Quality Objectives, which states in part, "*In conjunction with the issuance of NPDES and storm water permits, the Regional Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Board will consider the applicable procedures and guidelines in the EPA's Water Quality Standards Handbook and the TSD. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.*"

Section 1.4.2 of the SIP states that, "*with the exception of effluent limitations derived from TMDLs, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers ... The applicable priority pollutant criteria and objectives are to be met throughout a*

water body except within any mixing zone granted by the Regional Board. The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis. The Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board."

Section 1.4.2.1 of the SIP defines a dilution credit as, "*a numerical value associated with the mixing zone that accounts for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations. Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some or no priority pollutants in a discharge*."

In allowing mixing zones for constituents governed by the SIP, a mixing zone shall be as small as practicable and shall not:

- Compromise the integrity of the entire water body;
- Cause acutely toxic conditions to aquatic life passing through the mixing zone;
- Restrict the passage of aquatic life;
- Adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;
- Produce undesirable or nuisance aquatic life;
- Result in floating debris, oil, or scum;
- Produce objectionable color, odor, taste, or turbidity;
- Cause objectionable bottom deposits;
- Cause nuisance;
- Dominate the receiving water body or overlap a mixing zone from different outfalls; or
- Be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (SWRCB Resolution No. 88-63), this SIP supersedes the provisions of that policy.

2.4 Evaluation of Available Dilution for Acute Criteria

The Technical Support Document (TSD) states that: *"The CMC should be met within a distance of five times the local water depth in any horizontal direction from any discharge outlet. This restriction will prevent locating the discharge in very shallow environments or very close to shore, which would result in significant surface and bottom concentrations."* The outfall is located on the shore, which, by the TSD guidance, will greatly restrict the horizontal range that the acute criteria may be exceeded in the receiving water. Only a limited amount of water depth data was available around the outfall, but it appears to drop to about 4 feet within 10 feet of the bank. By the TSD, this provides about a 20-foot radius around the outfall for compliance with the CMC. The temperature modeling shows the discharge to remain concentrated on the surface of the receiving water and disperse horizontally and vertically as it moves downstream. With the spatial restrictions recommended by the TSD for compliance with acute criteria and the lack of dilution indicated by the temperature modeling at the outfall, no dilution is available for the acute aquatic criteria.

2.5 Evaluation of Available Dilution for Chronic Criteria

The TSD states that:
"Concentrations above the chronic criteria are likely to prevent sensitive taxa from taking up long-term residence in the mixing zone. In this regard, benthic organisms and territorial organisms are likely to be of greatest concern. The higher the concentration occurring within the isopleth, the more taxa are likely to be excluded, thereby affecting the structure and function of the ecological community. It is thus important to minimize the overall size of the mixing zone and the size of elevated concentration isopleths within the mixing zone."

The temperature model, while subject to the limitations discussed in section 2.2, provides information used as a basis to establish available dilution for compliance with chronic criteria to protect aquatic life. The model concludes that, for the timed discharge, the four degree F differential would reach a maximum area of 0.3 acre and would be contained in a shallow (less than one foot in depth) plume that hugs the east river bank until dissipating 450 feet downstream. The model also shows that significant vertical mixing does not occur until about 500 feet downstream at which point there will be contact with the benthic community. This is illustrated in Figure 8 of the Resource Management Associates, 2000, analysis. Using the conclusions of the temperature model, a 4 degree temperature differential downstream where the effluent and receiving water have a 15^{o}F initial difference indicates that mixing in the near field is small and does not reach 4:1 until nearly 450 feet downstream and 15:1 at 1300 feet downstream. Complete mixing, which is defined in the SIP as not more than a 5 percent difference in the concentration of a pollutant across a transect of the water body, would not occur until over 1000 feet downstream. The SIP requires that a mixing zone not dominate or compromise the integrity of the entire water body and shall be as small as practicable. The thermal modeling presented a spatial definition to the changes in temperature that occur in the receiving water as discussed in the previous paragraph. This allowed a mixing zone to be defined and dilution to be determined at the edge of this mixing zone. The mixing zone will be restricted to the surface layer of the water column in a plume hugging the eastern shore of the river and extending to 450 feet downstream of the outfall. Temperature differences at the edge of this mixing zone indicate that a 4:1 dilution exists at the edge of this mixing zone. For constituents subject to chronic aquatic criteria, a 4:1 dilution will be applied. This mixing zone will provide protection to the benthic community and minimize the impacts of the discharge to the river.

2.6 Evaluation of Available Dilution for Specific Constituents

The overlap of the plumes from the City of Manteca and the Brown Sand impoundment will limit the extent of a mixing zone for arsenic, a constituent of mutual concern between these discharges. Additionally, the receiving water monitoring shows an average arsenic concentration of 3.0 ug/l, exceeding the USEPA recommended water quality criterion for protection of human health at the 1-in-a-million risk level. Therefore, the receiving water lacks assimilative capacity for arsenic, and there is no dilution available.

The assimilative capacity of the river is dependent on the background concentration of the receiving water. Data collected in 2002 indicates that the receiving water has no assimilative capacity, and therefore no dilution can be granted for aluminum, electrical conductivity, iron, manganese, and mercury.

2.7 Evaluation of Available Dilution for Priority Pollutant Human Carcinogen Criteria

The human health-based criteria for carcinogens, other than arsenic, are based on safe levels for lifetime exposure and utilize the harmonic mean flow to represent the receiving water flow. The harmonic mean flow at Vernalis is 1976 cfs. The current annual average discharge rate is 5.72 mgd (8.9 cfs). A steady state analysis utilizing the harmonic mean flow provides a dilution of 222:1. The Regional Board is not required to grant a mixing zone or allocate the full assimilative capacity of the receiving water. For limitations based on human health criteria, dilution is limited to that required to maintain compliance. Where the ambient background concentrations are lower than the applicable human health criterion, the dilution credits determined in Table 12 of the Information Sheet apply for the determination of effluent limitations for carcinogens.

3 Biosolids Management

The City of Manteca currently discharges biosolids that has been dewatered in drying beds to City-owned farmland adjacent to the treatment plant at agronomic rates, as described in the Order. New limitations on metal concentrations in sludge/soil mixtures and new conditions for sludge use as a soil amendment have been established. This new permit requires the City to reevaluate the sludge and effluent application rates to land and submit a land application plan.

4 Pretreatment Program

The Discharger submitted a draft pretreatment program to the Regional Board for approval. The Regional Board, in an October 2001 Pretreatment Audit, identified areas of the program that were deficient or not implemented. The Regional Board staff, on 22 January 2003, provided comments to the Discharger identifying provisions of the City's Waste Ordinance and the Interjurisdictional Agreement between the City of Manteca and the Lathrop County Water District that are deficient. This Order provides a compliance schedule for the Discharger to submit a pretreatment program that corrects the deficiencies noted in the October 2001 Pretreatment Compliance Audit and in the 22 January 2003 letter. The Regional Board will reopen this Order to approve the pretreatment program upon submittal of a program that corrects the deficiencies. This Order requires full compliance with all pretreatment program requirements by **1 October 2004**.

5 Ground Water

Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, and metals. The Discharger's use of unlined ponds and the application of wastewater to land may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

a. The degradation is confined to a specified area;

b. The degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
c. The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable control technology (BPCT) measures; and
d. The degradation does not result in water quality less than that prescribed in the Basin Plan, e.g., does not exceed water quality objectives.

Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including an assessment of all wastewater-related constituents which may have migrated to groundwater, the vertical and lateral extent of any degradation, and an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives or standards. If groundwater quality is shown to have been degraded by the wastewater treatment processes or the discharge, the incremental change in pollutant concentration (when compared with background) may not be increased. This Order may also be reopened and specific numeric limitations established.

The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR, Section 20005 et seq. (hereafter Title 27). The exemption, pursuant to Title 27, CCR, Section 20090(a), is based on the following:

a. The waste consists primarily of domestic sewage and treated effluent;

b. The waste discharge requirements are consistent with water quality objectives; and

c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

This Order requires the Discharger to prepare technical and monitoring reports as authorized by California Water Code (CWC) Section 13267. This Order also requires that the Discharger conduct groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16, and to assure compliance with this Order.

6 Thermal Limitations

The State Water Resources Control Board (State Board) Water Quality Control Plan for Control of Temperatures in Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (the Thermal Plan) is applicable to this discharge. The Thermal Plan requires that such a discharge:

(a) shall not exceed the receiving water temperature by more than 20 °F;

(b) shall not create a zone, defined by water temperatures of more than 1°F above natural receiving water temperature which exceeds 25 % of the cross sectional area of the River at any point; and,

(c) shall not cause a temperature rise greater than 4 °F above the natural temperature of the receiving waters at any time or place.

For the purposes of compliance with the Thermal Plan, the Discharger is considered to be an existing discharger of elevated temperature waste. Monitoring by the Discharger indicates that the 20 degree ^{o}F limitation of Objective 5.A.(1)a of the Thermal Plan is occasionally exceeded in winter months when the receiving water is at its lowest temperatures. Modeling conducted by RMA, subject to the limitations discussed below, indicates that the current and the expanded flows with continuous discharge exceed both the 1 degree and 4 degree requirements of Objectives 5.A.(1)b and 5.A.(1)c of the Thermal Plan. The modeling also demonstrates that a timed discharge, that is, discharging only on the outgoing tide, for the increased flow exceeds only the 4 degree requirement, but not the 1 degree requirement. The Discharger has requested an exception to the 4 degree requirement of Objective 5.A.(1)c of the Thermal Plan which requires that the discharge shall not cause a surface water temperature rise greater than 4 ^{o}F above the natural temperature of the receiving waters at any time or place and has also requested a one month averaging period to meet the 20 degree limit of Objective 5.A.(1)a. An exception cannot be authorized at this time due to a number of factors. First, the accuracy of the temperature model results which are the basis for the receiving water limitation violations are questionable due to a lack of site data to calibrate and validate the model, the lack of accounting for atmospheric heat gains and loss from the proposed holding pond and the river, the lack of accounting for tidal cycles and recirculation from the limited model run time, and the lack of accounting for the Brown Sand, Inc. discharge adjacent to the City's discharge. Second, the Discharger has not conducted regular monitoring of temperature at the outfall as required in its previous permit, and the available information is based on a limited data set which correlates the temperature at the plant site and at the outfall. Third, the Discharger has not provided adequate evidence that a 30-day averaging period for Effluent Limitation B.11. will not cause adverse impacts to aquatic life. Finally, the Discharger does not currently have the capability to implement a timed discharge on out-going tides.

Effluent Limitations and Receiving Water Limitations are included to require compliance with the Thermal Plan. If adequate information is developed to support exceptions to the Thermal Plan, this Order may be reopened to modify limitations for Thermal Plan compliance.

Studies by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the University of California at Davis, et. al., have identified the Central Valley Chinook Salmon and the Central Valley Steelhead as sensitive species that are affected by elevated temperatures in the San Joaquin River. There are four runs of salmon in the Central Valley that results in there being adults and juveniles in portions of the Delta every month of the year (Moyle, 2000). Generally, adults would be moving upstream in the fall, and fry and smolt moving downstream in the winter and spring. River temperatures above 68 °F are unsuitable for supporting salmonoids (Draft EIR, 2000). Migration of adults is usually delayed when river temperatures reach this level. In a Department of Water Resources Study, adult salmon will cease migration if water temperatures are above 70 °F. At 77 °F, adult mortality may occur (Myrick, Cech, 2001). The Thermal Plan does not protect aquatic life from high temperature wastewater being discharged to an elevated temperature river. However, the Thermal Plan limits incremental increases in temperature. Discharge from the wastewater treatment plant of treated effluent with an elevated temperature may affect salmon and other migrating fish in the San Joaquin River. In so far as elevated temperature is deleterious to Chinook salmon, effluent temperature must be limited so as not to cause the receiving water to be harmful to the salmon. When the assimilative capacity of the river is diminished, effluent temperature must be held to the water quality criteria. The CALFED Bay-Delta Program target is to maintain water temperatures below 68 °F in migratory routes of anadromous fish in the spring and fall (CALFED, 2000). This Order requires the Discharger to study the thermal impacts to the receiving water associated with a discharge of treated effluent with elevated temperatures.

7 Antidegradation Analysis

The Regional Board must consider antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 and find that the permitted discharge is consistent with those provisions. With regard to surface water, the receiving water may exceed applicable water quality objectives for certain constituents as described in this Order. However, this Order requires the discharger, in accordance with specified compliance schedules, to meet requirements that will result in the use of best practicable treatment or control of the discharge and will result in compliance with water quality objectives. Table 1 of the information sheet provides an analysis of the mass loading to the receiving water for a number of constituents based on current operations and for an expanded discharge flow following plant upgrades. This Order requires compliance with technology-based standards and more stringent water quality-based standards. In developing effluent limitations, this Order allows the use of some of the assimilative capacity of the receiving water based on the current performance of the discharger and is consistent with the SIP. Where assimilative capacity is available in the receiving water, this Order does not authorize the full use of the assimilative capacity. This Order is consistent with California Water Code section 13263(b). Any further use of the assimilative capacity would not be consistent with Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant. The total allowable discharge to surface water of 9.87 mgd has been increased from 6.95 mgd from the previous Order. The discharge is consistent with Resolution 68-16 and 40 CFR section 131.12 because this Order requires the discharger to meet requirements that will result in best practicable treatment or control to assure that pollution or nuisance will not occur prior to allowing flows to increase.

With regard to groundwater, domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, and metals. The Discharger's use of unlined ponds and the application of wastewater and sludge to land may result in an increase in the concentration of these constituents in groundwater. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

a. The degradation is limited in extent;
b. The degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
c. The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable control technology (BPCT) measures; and
d. The degradation does not result in water quality less than that prescribed in the Basin Plan, e.g., does not exceed water quality objectives.

The discharge to land authorized by this Order must comply with groundwater limitations, ground water monitoring requirements and a schedule to evaluate whether the Discharger is implementing best practicable treatment or control of the discharge. Compliance with this Order will result in use of best practicable treatment or control and will not further degrade the groundwater.

8 Acute Toxicity

Order No. 97-115 prescribed stricter acute toxicity test procedures than the Discharger's previous permit. Specifically, the acute toxicity bioassay parameters were revised to require compliance with the latest testing procedures contained in EPA/600/4-90/027F. The new USEPA procedure requires the use of larval stage (0 to 14 days old) fathead minnows or golden shiners instead of the previous method of using juveniles (15 to 30 days old). Larvae are much more sensitive to ammonia levels than the juvenile species. The new USEPA procedure for the acute bioassay test constitutes a more stringent acute toxicity limitation. This Order allows the Discharger to remove ammonia prior to conducting acute toxicity tests until 1 April 2004, when facilities are required to be operational to fully nitrify the wastewater.

9 Non-priority pollutants

9.1 Residual Chlorine

The Discharger currently uses chlorine for disinfection and has reported that it uses sodium hypochlorite for maintenance. Chlorine is extremely toxic to aquatic organisms. The Discharger uses a sulfur dioxide process to dechlorinate the effluent, but will discontinue this with the installation of the UV disinfection system. Because of the existing chlorine use and the future use of hypochlorite solutions without effluent dechlorination, there is reasonable potential for chlorine to be discharged at toxic concentrations. The Basin Plan contains a narrative toxicity objective. Consistent with 40 CFR 122.44(d), it is appropriate to use the USEPA ambient water quality criteria for chlorine for protection of freshwater aquatic life of 11 ug/l as a 4-day average (chronic) concentration, and 19 ug/l as a 1-hour

average (acute) concentration to implement the narrative toxicity objective. Therefore, this Order includes water quality based effluent limitations for chlorine based on the USEPA ambient criteria to protect freshwater aquatic life.
The WQCF outfall is a side bank discharge to the San Joaquin River. The chlorine residual limitations required in this Order are protective of aquatic organisms in the undiluted discharge. Because of this, the Regional Board does not anticipate residual chlorine impacts to benthic organisms if compliance is maintained.

9.2 Salinity

The discharge contains total dissolved solids (TDS), chloride and electrical conductivity. These are water quality parameters that are typically indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of the water for human consumption. There are no USEPA water quality criteria for protection of aquatic organisms for these constituents. The Basin Plan "Chemical Constituent" objective incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for electrical conductivity. The secondary California maximum contaminant level (MCL) for TDS is 500 mg/l as a recommended level, 1000 mg/l as an upper level, and 1500 mg/l as a short-term maximum. The recommended agricultural water quality goal for TDS, that would implement the narrative "Chemical Constituent" objective, is 450 mg/l as a long-term average based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). *Water Quality for Agriculture* evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of sensitive agricultural uses. The recommended agricultural water quality goal for chloride, that would implement the narrative "Chemical Constituent" objective, is 106 mg/l based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The Basin Plan water quality objectives for electrical conductivity for the South Delta are 700 umhos/cm (from 1 April to 31 August) and 1000 umhos/cm (from 1 September to 31 March). State Board Decision 1641 (D-1641) (water rights) requires that the 1000 umhos/cm objective be met year round until 1 April 2005 at which time the seasonal objectives will be effective.

A review of the Discharger's monitoring reports from January 1998 through December 2002 indicates an annual average TDS effluent concentration of 634 mg/l, a lowest monthly average of 540 mg/l, and a highest monthly average of 727 mg/l. These concentrations exceed the applicable objectives. Limited TDS data collected at receiving water sample location R1 from January 2002 through December 2002 showed a TDS concentration range from 210 mg/l to 1300 mg/l with an average of 500 mg/l in 12 sampling events. The Regional Board report *Total Maximum Daily Load for Salinity and Boron in the Lower San Joaquin River (January 2002)* presented monthly average TDS data for the San Joaquin River at Vernalis from October 1976 through September 1997. The Vernalis data showed a maximum monthly average TDS of 1024 mg/l with 57 of 252 months having monthly averages greater than 500 mg/l. These data indicate that the receiving water frequently exceeds water quality objectives to protect its beneficial uses and lacks assimilative capacity for TDS. As water exported from the Delta by the State Water Project is, in part, mixed with Colorado River water to

provide municipal water supply with an acceptable TDS, any increase in salt concentration effectively reduces the available water supply in Southern California (*Metropolitan Water District of Southern California, Salinity Management Study, 1998*).

Chloride concentrations in the effluent ranged from 100-230 mg/l with an average of 138 mg/l based on 16 samples collected during 2002. Background concentrations in the San Joaquin River ranged from 51-170 mg/l with an average of 98 mg/l based on results from eleven samples collected during 2002. Both the receiving water and the effluent exceed the agricultural use-protective water quality limit of 106 mg/l, based on the narrative objective.

Electrical conductivity (EC) shows reasonable potential to exceed water quality objectives in both the effluent and in the receiving water. A review of the Discharger's monitoring reports from January 1998 through December 2002 shows the annual average effluent EC is 1099 umhos/cm, the lowest monthly average is 819 umhos/cm, and the highest monthly average is 1300 umhos/cm. These levels exceed the applicable objectives. EC data collected at receiving water sample location R1 from January 2002 through December 2002 show that the conductivity in the receiving water ranged from 380 umhos/cm to 1100 umhos/cm and averaged 686 umhos/cm in 12 sampling events. Hourly EC data collected at the Department of Water Resources (DWR) Mossdale monitoring station (RSAN087) from December 2000 through September 2002 show that the conductivity in the San Joaquin River ranged from 299 umhos/cm to 1131 umhos/cm and averaged 721 umhos/cm. San Joaquin River monitoring for electrical conductivity at Vernalis between 1985 and 1998 showed frequent exceedances of the EC water quality objectives (Reference Figure 1-3, *Total Maximum Daily Load for Salinity and Boron in the Lower San Joaquin River (January 2002)*). These data show that the receiving water frequently has no assimilative capacity for EC. An Effluent Limitation for electrical conductivity is included in this Order and is based on the Basin Plan water quality objective for electrical conductivity in the South Delta.

The TDS, chloride, and electrical conductivity objectives and recommended levels are all measures of the salt content of the water. Compliance with the Effluent Limitations for electrical conductivity based on the Basin Plan seasonal water quality objectives of 700 umhos/cm and 1000 umhos/cm will be protective of the chloride and TDS recommended levels; therefore, no limitations are included for chloride and TDS.

9.3 Aluminum

Aluminum concentrations in the effluent were detected in the range from 70 ug/l to 350 ug/l in sampling conducted in 2002. Aluminum was detected in the receiving water (R-1) in the range from 420 ug/l to 2200 ug/l in 12 samples collected between January 2002 and December 2002. Dissolved concentrations of aluminum in the effluent and the receiving water were significantly less than the totals listed above. The Basin Plan's chemical constituents water quality objective prohibits chemical constituents in concentrations that exceed state MCLs or that adversely affect beneficial uses. MUN is a beneficial use of the San Joaquin River. The Primary and Secondary MCLs for aluminum are 1000 ug/l and 200 ug/l respectively. The Basin Plan contains a narrative toxicity objective. Consistent with 40 CFR 122.44(d), USEPA's Ambient Water Quality Criteria for protection of freshwater aquatic life

for aluminum expressed as total recoverable are 750 ug/l (1-hour average) and 87 ug/l (4-day average), and are appropriate to implement the narrative toxicity objective. Since both the receiving water and the effluent exceed USEPA's ambient water quality criteria and the secondary MCL, no dilution can be granted. The effluent has the reasonable potential to cause or contribute to an in-stream excursion above water quality objectives for aluminum. Therefore, this Order includes an effluent limitation for Aluminum of 71 ug/l as a 30-day average and 143 ug/l as the daily maximum. The monitoring data are included in Table 3 and the effluent limitation calculations are included in Table 6.

9.4 Iron

Iron concentrations in the effluent ranged from 170-730 ug/l while background concentrations in the San Joaquin River ranged from 780-2800 ug/l based on results from 12 samples collected between January 2002 and December 2002. The Basin Plan chemical constituents objective includes a receiving water objective in Table III-1 for iron of 300 ug/l in the Delta, and the secondary MCL for iron of 300 ug/l. Both the receiving water and the effluent exceed the Basin Plan numeric objective and the secondary MCL. Water quality based effluent limitations are included in this Order based on the Basin Plan chemical constituents objective. The data are included in Table 3 and the effluent limitation calculations in Table 6.

9.5 Manganese

Manganese concentrations in the effluent ranged from 13-120 ug/l while background concentrations in the San Joaquin River ranged from 82-220 ug/l based on results from 11 samples collected between January 2002 and December 2002. The Basin Plan chemical constituents objective includes a receiving water objective in Table III-1 for manganese of 50 ug/l in the Delta, and the secondary MCL for manganese of 50 ug/l. Both the receiving water and the effluent exceed the Basin Plan numeric objective and the secondary MCL. Water quality-based effluent limitations are included in this Order based on the Basin Plan chemical constituents objective. The data is included in Table 3 and the effluent limitation calculations in Table 6.

9.6 Methylene blue active substances (MBAS)

The effluent contains MBAS at levels that may cause or contribute to exceedances in the receiving waters of water quality objectives in the Basin Plan. The Basin Plan includes the "Chemical Constituents" objective that incorporates state MCLs that applies to waters designated MUN. MUN is a designated beneficial use of the San Joaquin River. The Secondary MCL Consumer Acceptance Limit is 500 ug/l for foaming agents (MBAS). The Basin Plan also includes water quality objectives that water not contain floating material or taste- or odor-producing substances in concentrations that causes nuisance or adversely affect beneficial uses. The Basin Plan identifies non-contact water recreation, which includes aesthetic enjoyment, as a beneficial use of the San Joaquin River. MBAS concentrations in excess of the Secondary MCL produce aesthetically undesirable froth, taste, and odor. Foam has been observed on the surface of the discharge plume from the WQCF. MBAS was detected in an effluent sample collected 13 June 2002 at a concentration of 1,800 ug/l. The maximum observed upstream receiving water MBAS concentration is less than 20 ug/l. These data were used in

calculating Effluent Limitations for MBAS (see Table 6). Because of the observed foaming at the outfall, no dilution is available for MBAS. An Effluent Limitation for MBAS is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents, floating material, and tastes and odors.

9.7 Molybdenum

The recommended agricultural water quality goal for molybdenum, that would implement the narrative "Chemical Constituent" objective, is 10 ug/l based on *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Molybdenum was not monitored in the effluent or in the receiving waters. Because of the uncertainty associated with the lack of monitoring, additional studies of this constituent are warranted to more thoroughly evaluate reasonable potential for this constituent to exceed criteria. MRP No. R5-2004-0028 specifies monitoring for this pollutant. If the monitoring shows a reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened for addition of appropriate effluent limitations.

9.8 Carbofuran

The Basin Plan contains a narrative objective for toxicity that prohibits concentrations of toxic substances that could produce detrimental physiological responses in humans. Public Health Goals published by OEHHA provide a measure of an amount of a toxic substance that, if exceeded could contribute to toxicity in humans who consume the water for municipal or domestic supply (MUN). MUN is a designated beneficial use of the receiving water. Carbofuran was detected in the effluent and receiving water at concentrations greater than the Public Health Goalof 1.7 ug/l. Because the data were greater than the method detection limit but less than the laboratory's reporting (quantitation) limit, the data were flagged as "detected but not quantified". Additional monitoring is required. If the monitoring shows a reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened to consider incorporation of appropriate effluent limitations.

9.9 Nitrate and Nitrite

Nitrate and nitrite are known to cause adverse health effects in humans. The Basin Plan's chemical constituents water quality objective prohibits chemical constituents in concentrations that exceed drinking water Maximum Contaminant Levels (MCLs) published in Title 22 of the California Code of Regulations or that adversely affect beneficial uses. Municipal and domestic water supply is a beneficial use of the San Joaquin River. The California Department of Health Services (DHS) has adopted Primary Maximum Contaminant Levels (MCLs) for the protection of human health for nitrite and nitrate that are equal to 1 mg/l and 10 mg/l (measured as nitrogen), respectively. Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 ug/l for the sum of nitrate and nitrite, measured as nitrogen. The discharge from the WQCF has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for nitrite and nitrate because of the nitrification and denitrification processes. Effluent limits for nitrite and nitrate are based on the MCLs. Effluent Limitations for nitrite and nitrate are included in this Order to assure the treatment process

adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of municipal and domestic supply.

10 Ammonia-Nitrogen

This section provides a detailed discussion and evaluation of ammonia in the effluent.

A review of the Discharger's monitoring reports from January 1998 through December 2002 shows an average ammonia effluent concentration of 18 mg/l, a minimum concentration of less than 0.1 mg/l, and a maximum concentration of 43 mg/l. The data indicate very little seasonal fluctuation. Receiving water monitoring (R-1) was conducted from January 2002 through December 2002 (see Table 4). The receiving water data showed an average of 0.2 mg/l with a minimum of less than 0.01 mg/l and a maximum of 1.4 mg/l.

10.1 Toxicity Criteria

The USEPA 1999 Update of Ambient Water Quality Criteria for Ammonia provides the applicable water quality criteria for this pollutant. Ammonia is not a priority pollutant; therefore, USEPA guidance, rather than the SIP, is applicable for reasonable potential and effluent limitation calculations. Section 4.3.3 of the TSD allows the consideration of exposure duration in evaluating toxicity to organisms passing through a mixing zone. When evaluating either an acute or chronic mixing zone for ammonia, the pH of the mixture of effluent and receiving water should be used to determine appropriate criteria to be applied within that mixing zone. The pH in the mixing zone will be a function of the effluent pH and the ambient dilution water pH being mixed together. The pH is an important factor because toxicity of ammonia increases logarithmically as pH increases.

10.2 Consideration of Aquatic Organisms

The most stringent acute ammonia criteria are applied when salmonoids are present within the water column. The San Joaquin River at Manteca is a migratory path for salmon, and they are likely to be present in the river at any time of the year. The chronic ammonia criteria are most stringent when early life stages (ELS) of aquatic species are present. In response to a request for information regarding the time of year ELS of fish are present in the San Joaquin River near the Deep Water Ship Channel (DWSC), a Department of Fish and Game memorandum, dated
27 February 2001, states ELS of multiple fish and invertebrates species are present in the San Joaquin River year-round. Therefore, both acute and chronic ammonia toxicity are based on the assumption that both salmonoids and ELS of fishes are present in the San Joaquin River near the Manteca WQCF outfall year-round.

10.3 Reasonable Potential Evaluation

The reasonable potential evaluation shows that the WQCF effluent has reasonable potential to cause or contribute to an in-stream excursion above USEPA acute and chronic water quality criteria for ammonia. This has been demonstrated by determining reasonable potential based on critical

conditions that are a combination of worst-case observations[1] using effluent data and using receiving water data (see Table 7). Consistent with 40 CFR section 122.44(d)(vi)(A) and the Basin Plan "Policy for Application of Water Quality Objectives", this Order implements the Basin Plan narrative toxicity objective by applying USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia. This Order includes effluent limitations for ammonia, based on the narrative toxicity objective and the USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life.

The acute criterion or criteria maximum concentration (CMC) for ammonia is a function of receiving water pH and is stated as a 1-hour average concentration. A worst-case scenario occurs when there is little to no dilution of the effluent by the receiving water. This was discussed in the previous dilution section. Therefore, for the acute criteria, water quality objectives need to be achieved in the effluent at the end-of-pipe. As allowed by the TSD, this Order calculates the CMC using critical conditions that are a combination of worst-case observations. The acute criterion for ammonia is determined by evaluating the maximum effluent pH at the end of the pipe. The maximum allowable effluent pH is 8.0. The calculated CMC for this condition is 5.6 mg/l ammonia as N. The maximum effluent concentration, measured on 15 August 2001, was 42.8 mg/l ammonia as N. This exceeds the calculated ammonia CMC value. Even using the mean effluent ammonia concentration of 17.7 mg/l exceeds the CMC value under worst-case pH conditions. This scenario shows that there is reasonable potential for acute water quality objectives to be exceeded by effluent ammonia concentrations.

The receiving water pH and ammonia concentrations were also evaluated to determine if there is reasonable potential to cause acute ammonia toxicity, based upon concentrations found in the receiving water. The acute criterion is determined using the receiving water pH. In July 2002, the receiving water reached a maximum pH of 9.3, as recorded by the City at the R-1 monitoring site. The receiving water ammonia concentrations determined by the discharger's monitoring during 2002 indicated a maximum concentration of 1.4 mg/l with an average of 0.2 mg/l. As determined by the TSD approach, the receiving water at times may exceed the CMC for ammonia.

The chronic criterion, or criteria continuous concentration (CCC), for ammonia is a function of both pH and temperature. For ammonia, the CCC is stated as a 30-day average concentration, with the highest 4-day average within the 30-day average not to exceed 2.5 times the CCC. As allowed by the TSD, the CCC is calculated using critical conditions that are a combination of worst-case observations. The highest receiving water 30-day average pH was 9.1, observed during June/July 1992 at the DWR Mossdale monitoring station. The maximum 30-day average temperature of 25.7 C (78.3 F) was observed during July 2002 at the DWR Mossdale monitoring station. The calculated CCC for this condition is 0.21 mg/l ammonia-N. The effluent 30-day average ammonia concentration during that same period was 14.1 mg/l ammonia as N and
17.7 mg/l averaged over the past 5 years. The calculated CCC is exceeded which demonstrates that the effluent has the reasonable potential to cause or contribute to chronic ammonia toxicity in the receiving water.

[1] EPA Technical Support Document, March 1991, Chapter 3

The monthly average receiving water pH and temperature from the Mossdale monitoring station, and ammonia concentrations collected from the R-1 sample location during 2002 were evaluated to determine if concentrations have been observed in the receiving water above the chronic criteria. The TSD method demonstrated a reasonable potential for the receiving water to exceed the chronic ammonia toxicity. The maximum ammonia concentration of 1.4 mg/l also demonstrates that there are times when there is no assimilative capacity in the receiving water for additional ammonia.

10.4 Effluent Ammonia Limits

Based on the above discussion of reasonable potential, daily and monthly effluent ammonia limitations are required to protect aquatic organisms from ammonia toxicity. The USEPA TSD recommends that statistical permit limit derivations be used to develop chemical specific limitations for NPDES permits. Effluent limitations are calculated as shown in Table 8. Because of the seasonal variation in pH and temperature of the receiving water and the sensitivity of the ammonia criteria to these conditions, seasonal limitations are established.

For the warm weather months from 1 June to 30 September, the maximum permitted monthly average effluent pH is 8.0, the maximum historical monthly average receiving water pH is 9.1, the maximum historical monthly average effluent temperature is 27.2 F, and the maximum historical monthly average receiving water temperature is 25.7 F. The pH and temperature at the edge of a 4:1 mixing zone were estimated utilizing the USEPA DESCON program. These estimations are utilized in Table 8 to calculate effluent limitations that maintain compliance with chronic aquatic criterion in the receiving water outside of the mixing zone. Effluent limitations compliant with acute criteria for conditions at the end-of-pipe are also determined, but the more restrictive chronic criteria determine the final effluent limitations. Table 8 provides a daily maximum effluent limitation of 4.4 mg/l ammonia as N and a 30-day average effluent limitation of 2.1 mg/l. As defined by the 1999 criteria, the 4-day average CCC ammonia concentration shall not exceed 2.5 times the value of the 30-day CCC. However, considering the maximum daily limitation is less than 2.5 times the CCC in all cases, the 4-day average cannot exceed the maximum daily limitation.

For the cool weather months from 1 October to 31 May, the maximum permitted monthly average effluent pH is 8.0, the maximum historical monthly average receiving water pH is 8.5, the maximum historical monthly average effluent temperature is 25.2 F, and the maximum historical monthly average receiving water temperature is 19.6 F. The pH and temperature at the edge of a 4:1 mixing zone were estimated utilizing the USEPA DESCON program. These estimations are utilized in Table 8 to calculate effluent limitations that maintain compliance with chronic aquatic criterion in the receiving water outside of the mixing zone. Effluent limitations compliant with acute criteria for conditions at the end-of-pipe are also determined. In this case, the more restrictive acute criteria determine the final effluent limitations. Table 8 show that the acute criteria using the maximum permitted effluent pH of 8.0 provides a daily maximum effluent limitation of 5.6 mg/l ammonia as N and a 30-day average effluent limitation of
2.8 mg/l.

The Clean Water Act requires publicly owned treatment works to comply with the secondary treatment and applicable water quality standards existing prior to 1 July 1977. USEPA's regulations state that any NPDES compliance schedule may not extend beyond an applicable Clean Water Act statutory deadline. Therefore, a compliance schedule that extends the date for compliance with water quality standards that existed prior to 1 July 1977 may not be included in the Order.

11 Priority Pollutants

This section and its subsections discuss how priority pollutants are evaluated against criteria and how limitations and interim requirements are developed.

For priority pollutants, guidance for determining reasonable potential, effluent limitations, and compliance schedules is provided by the SIP, adopted in March 2000 by the SWRCB. USEPA promulgated the numeric water quality criteria for priority pollutants with the adoption of the CTR in May 2000. Table 10 summarizes the priority pollutants of concern and their respective criteria.

Priority pollutant constituents were analyzed in the effluent and the receiving water (location R-1) from January 2002 to December 2002. The results of these analyses were evaluated for their reasonable potential to exceed Basin Plan, CTR, or other applicable criteria. Section 1.3 of the SIP establishes the guidance for reasonable potential analysis. Table 10 summarizes the reasonable potential analysis of the detected constituents.

11.1 Inorganic Priority Pollutants

The inorganic pollutants **arsenic**, **copper** and **cyanide** were found to have a reasonable potential to cause or contribute to an exceedance of the applicable Basin Plan objectives. Effluent limitations are therefore required for arsenic, copper, and cyanide.

Based on the information received from the Discharger, the use of the steady-state model described in Section 1.4B of the SIP was utilized for calculating effluent limitations. Dilution credits are provided to the degree indicated in the dilution evaluation (see section 2). The acute and chronic criteria for copper are a function of hardness. In general, lower hardness values provide more stringent criteria. The hardness value expected to occur at the point in the receiving water where the standard applies, is considered the design hardness. San Joaquin River hardness data is available at Vernalis, Mossdale, and at the Manteca outfall (R-1). The data sets have similar values. There is more river hardness data available over a longer period at Vernalis, therefore, the Vernalis data were used to evaluate receiving water hardness. In determining design hardness, the Regional Board analyzed the receiving water hardness measured at Vernalis during periods when critical low flow was probable (i.e. San Joaquin River flow at Vernalis ranging from 800 cfs to 1,200 cfs). The effluent hardness was also utilized for the acute criteria calculations where dilution is not available.

Receiving water hardness is generally flow-related with lower flows providing higher hardness values. To determine the design hardness, receiving water hardness and flow data collected from the USGS monitoring station at Vernalis from 1950 through 1999 were evaluated. The dataset was filtered for

hardness under design flow conditions (see Figure 1). The minimum flow at Vernalis is approximately 1000 cfs which is the flow that the U.S. Bureau of Reclamation maintains at Vernalis to meet the 1995 Water Quality Control Plan salinity objective of 1000 umhos/cm. Hardness data was then evaluated in the range of 800 to 1,200 cfs. The receiving water hardness generally ranged from 150 to 250 mg/l as $CaCO_3$ with the lowest observed receiving water hardness under these conditions being 108 mg/l $CaCO_3$. At a hardness of 108 mg/l, the chronic criterion, or criterion continuous concentration (CCC), for copper is 9.6 ug/l.

Effluent hardness values ranged from 170 mg/l to 190 mg/l during the period from March 2002 to December 2002. Because no dilution is allowed for effluent limitations based on acute criteria, the minimum effluent hardness value of 170 mg/l was used for calculating effluent limitations. Using the minimum effluent hardness, the acute criterion, or criterion maximum concentration (CMC), for copper is 22.2 ug/l as dissolved, based on the SIP. However, the hardness dependent SIP criterion exceeds the Basin Plan site-specific objective of 10 ug/l as dissolved. Therefore, the copper effluent limits were calculated using a CMC of 10 ug/l as dissolved. Effluent limitations, which are expressed as total recoverable, are somewhat higher after the application of a 0.96 translator. There have been no approved studies by the Discharger to evaluate discharge-specific metal translators for copper; therefore, the default USEPA translators within the CTR were used in the calculation of the final effluent limitations.

The final effluent limitations were calculated using a steady-state model method described in Section 1.4 of the SIP. Section 5.4.4 of the TSD was utilized to determine the monthly average limit for arsenic. Water quality-based effluent limitations are included in this Order based on the Basin Plan chemical constituents objective. The data are included in Table 9 and the effluent limitation calculations in Table 11.

11.2 Human Carcinogens

There were five (5) human carcinogenic compounds present in the WQCF effluent. As summarized in Table 10, dibromochloromethane, bromodichloromethane, 2,4,6-trichlorophenol, and bis(2-ethylhexyl)phthalate were determined to present reasonable potential to exceed a one-in-a-million incremental human cancer risk criteria for water and/or organism consumption. Chloroform does not show reasonable potential to exceed the primary MCL. None of these constituents were detected in the receiving water.

11.2.1 Total Trihalomethanes and Chloroform

Information submitted by the Discharger indicate that the effluent contains trihalomethanes (THMs) including chloroform. The Basin Plan contains the "Chemical Constituent" objective that requires, at a minimum, that waters with a designated MUN use not exceed California MCLs. In addition, the Chemical Constituent objective prohibits chemical constituents in concentrations that adversely affect beneficial uses. The California's Drinking Water Standard primary MCL for total THMs is 100 ug /l. The USEPA primary MCL for total THMs is 80 ug/l, which was effective on 1 January 2002 for surface water systems that serve more than 10,000 people. Pursuant to the Safe Drinking Water Act,

DHS must revise the current total THMs MCL in Title 22 CCR to be as low or lower than the USEPA MCL. Total Trihalomethanes (THMs) include bromoform, bromodichloromethane, chloroform, and dibromochloromethane. Chloroform does not have promulgated CTR criteria. The State Board, in WQO No 2003-0002, stated that the Drinking Water Standard primary MCL for Total THMs of 80 ug/l could be applied to address chloroform in the discharge regulated in that Order. In addition, the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. This cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/l (ppb) at the 1-in-a-million cancer risk level with the consumption of the drinking water over a 70-year lifetime. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters.

MUN is a designated beneficial use of the receiving water. However, there are no known drinking water intakes on the San Joaquin River within several miles downstream of the discharge, and chloroform is a non-conservative pollutant. Therefore, to protect the MUN use of the receiving waters, the Regional Board finds that, in this specific circumstance, application of the USEPA MCL for total THMs for the effluent is appropriate, as long as the receiving water does not exceed the OEHHA cancer potency factor's equivalent receiving water concentration at a reasonable distance from the outfall (e.g., before reaching the drinking water intakes). Effluent samples collected from January 2002 through December 2002 indicated that THMs were present with a maximum concentration of 17 ug/l and an average concentration of 10 ug/l. Chloroform samples collected over the same period contained a maximum concentration of 12 ug/l and an average concentration of 8 ug/l. Considering the available dilution based on the harmonic mean flow of the San Joaquin River, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the water quality objective for MUN use by causing an exceedance of the USEPA primary MCL for total THMs or the chloroform OEHHA cancer potency factor's equivalent receiving water concentration. Therefore, effluent limitations for total THMs and chloroform are not included in this Order.

11.2.2 Effluent Limitations for Human Carcinogenic Priority Pollutants

The effluent limitation calculation procedures in Section 1.4 of the SIP allow for the granting of a dilution credit which, in this case, is 222-fold based on the harmonic mean flow of the San Joaquin River at Vernalis and the average discharge flow. However, the Regional Board finds that granting of this dilution credit would allocate an unnecessarily large portion of the River's assimilative capacity for these constituents and could violate the Antidegradation Policy. Instead, effluent limitations have been developed based on the amount of dilution that would be required, such that receiving water concentrations for these constituents would be met when effluent concentrations are at estimated maximum levels as determined by taking the mean plus 3.3-standard deviations or the maximum observed concentration, which ever is larger, for data sets with 10 or more values. For data sets with

less than 10 values, the maximum effluent concentration and a 3.11 multiplier (from Table 5-2 of the TSD) provides the estimated maximum levels. The calculations of the allowed dilution are shown in Table 12 which: (1) summarizes the monitoring data for the human carcinogens that have reasonable potential to exceed human carcinogen criteria; (2) summarizes the statistics used in calculating the estimated maximum concentration; and, (3) determines the amount of dilution that would be required to meet the applicable human-carcinogen criteria. Final effluent limitations are calculated and summarized in Table 13.

11.2.3 Ability to Meet Effluent Limitations and Interim Requirements

Based on historical effluent data, the WQCF can meet the effluent limitations for dibromochloromethane, bromodichloromethane, 2,4,6-trichlorophenol, and bis(2-ethylhexyl)phthalate. Additionally, because the plant will install a UV disinfection system by 1 February 2009, the THM constituents are expected to decrease significantly.

Section 1.4.2.2.B of the SIP requires, among other things, that when a mixing zone/dilution credit is granted, the permit must specify the point in the receiving water where the applicable criteria/objectives must be met. The Discharger has not performed such an analysis over a variety of flow conditions. However, considering the long-term averaging period for human carcinogens, the infrequency of critical conditions and worst-case effluent concentrations, and the fact that there are no drinking water intakes for numerous miles down- or up-stream of the discharge, the Regional Board finds the lack of a detailed mixing zone study is not significant enough to postpone the imposition of final effluent limitations for dibromochloromethane, bromodichloromethane, 2,4,6-trichlorophenol and bis (2-ethyhexyl)phthalate.

11.2.4 Receiving Water Monitoring for Human Carcinogen Priority Pollutants

Receiving water monitoring of human carcinogens is required to provide assurance that water quality criteria are being met downstream of the discharge and that the beneficial use of municipal supply is being protected. Although a mixing zone analysis has not been performed to delineate the specific boundaries of the mixing zone for human carcinogens, the samples collected at the existing R-1 and R-4 receiving water monitoring locations should provide adequate information to demonstrate compliance with water quality criteria.

11.3 Bioaccumulatives

Based on information submitted by the Discharger, the Regional Board concludes that the discharge contains **mercury**. The Delta waterways are listed in accordance with Clean Water Act Section 303(d) as impaired for mercury based on bioaccumulation of this pollutant in fish tissue. The CTR contains criteria for mercury. The CTR criteria, however, do not address bioaccumulation in the river. The WQCF effluent contains detectable levels of mercury below CTR priority pollutant criteria. However, the bioaccumulation rates in fish tissue used to calculate the CTR water quality criteria are based only on a laboratory derived bioconcentration factor that considers organism uptake from water only and does not consider the contribution from the organism's food source. Therefore, the CTR criteria are

not protective of actual bioaccumulation conditions in the River. Health advisories by the Department of Health Services remain in effect for human consumption of fish in the Delta, including the San Joaquin River at Manteca, due to excessive concentrations of mercury in fish tissue. These current warnings and available fish tissue data confirm that there is currently no assimilative capacity in the Delta for mercury.

Group A organo-chlorine pesticides, which include lindane, endrin aldehyde and DDT are also on the 303(d) listing. The Basin Plan sets forth a water quality objective that requires that organo-chlorine pesticides not be present in the water column in detectable concentrations. The SIP designates acceptable minimum laboratory detection levels for lindane, endrin aldehyde and DDT at 0.02 ug/l, 0.01 ug/l and 0.01 ug/l, respectively. The organo-chlorine pesticide effluent concentrations and corresponding reporting levels are at or below the SIP minimum levels and meet the Basin Plan objective. Based on these considerations, effluent limitations for Group A pesticides are not required in this Order.

Effluent samples collected from January 2002 to December 2002 contained mercury concentrations ranging from 0.013 ug/l to 0.028 ug/l. Receiving water monitoring for mercury over the same period provided results ranging from 0.0036 ug/l to 0.0093 ug/l. Table 14 summarizes the mercury data and statistics associated with the mercury results.

The effluent and receiving water have also been monitored for Group A pesticides and PCBs on four occasions during 2002. Dioxin (2,3,7,8-TCDD) was monitored twice during 2002. These constituents were not detected in the effluent or receiving water samples. Detection limits for DDT, PCB and the 2,3,7,8-TCDD were not adequate to determine compliance with the water quality criteria, therefore continued monitoring is required in this Order. Table 10 summarizes these results.

11.3.1 Interim Requirements - Bioaccumulative Priority Pollutants

The SIP recommends that the Regional Board consider whether the mass loading of bioaccumulative pollutants should be limited in the interim to "*representative current levels*" pending development of applicable water quality standards or TMDL allocation. The intent is, at a minimum, to prevent further impairment while a TMDL for a particular bioaccumulative constituent is being developed. Any increase in loading of mercury to an already impaired water body would further degrade water quality.

An interim effluent mass limitation for mercury has been determined using the WQCF design flow of 8.11 mgd and the maximum observed concentration. The data and calculation, as summarized in Table 14, provided an interim yearly mass limitation for mercury of 0.69 pounds/year (as total recoverable).

To track the Discharger's compliance with the interim mass limitation, the Discharger is required to calculate a 12-month consecutive running average of the mass loading for mercury. Starting on the 12th month after adoption of this permit, and for every month thereafter, the total mass pollutant loading for the previous twelve months will be reported in the monthly discharge monitoring reports and compared against the interim mass limitation calculated in the previous section. In addition to the

numeric interim mass-based limitation for mercury, this Order requires the Discharger to prepare a pollutant prevention plan in compliance with CWC 13263.3(d)(3) for mercury.

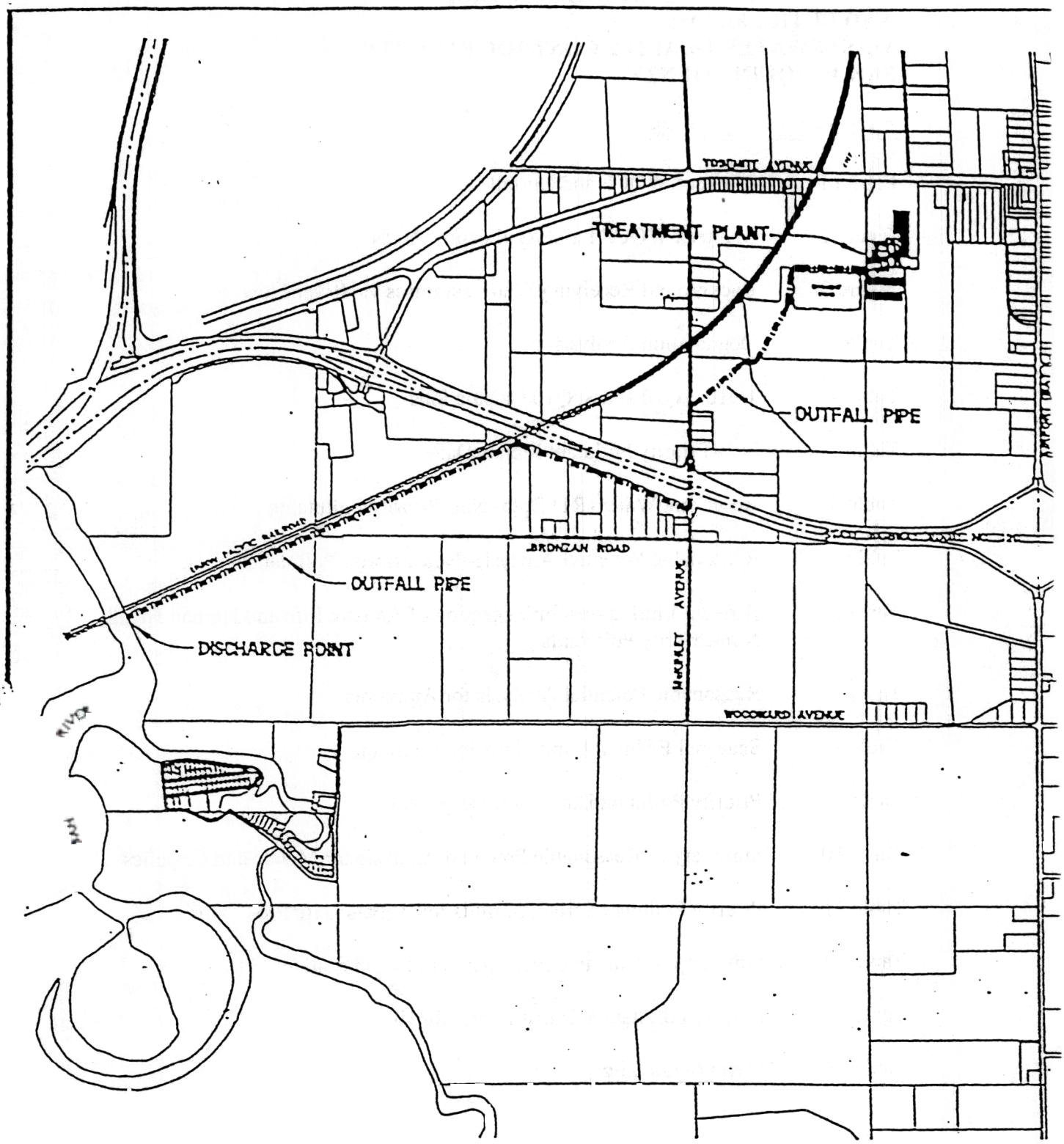
The final effluent limitations (mass load allocations) for mercury in the WQCF effluent will come from the TMDL. If the Regional Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for this Discharger.

MWK

INFORMATION SHEET ORDER NO. R5-2004-0028 **ATTACHMENT A**
CITY OF MANTECA, CITY OF LATHROP
AND DUTRA FARMS
WASTEWATER QUALITY CONTROL FACILITY
SAN JOAQUIN COUNTY

FIGURES AND TABLES

F gu e



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CITY OF MANTECA & CITY OF LATHRO
WASTEW TER QUALITY CONTROL FACILITY
CITY F MANTECA, SAN JOAQUIN COUNT

SECTION .2 6E. M.

Figure 2

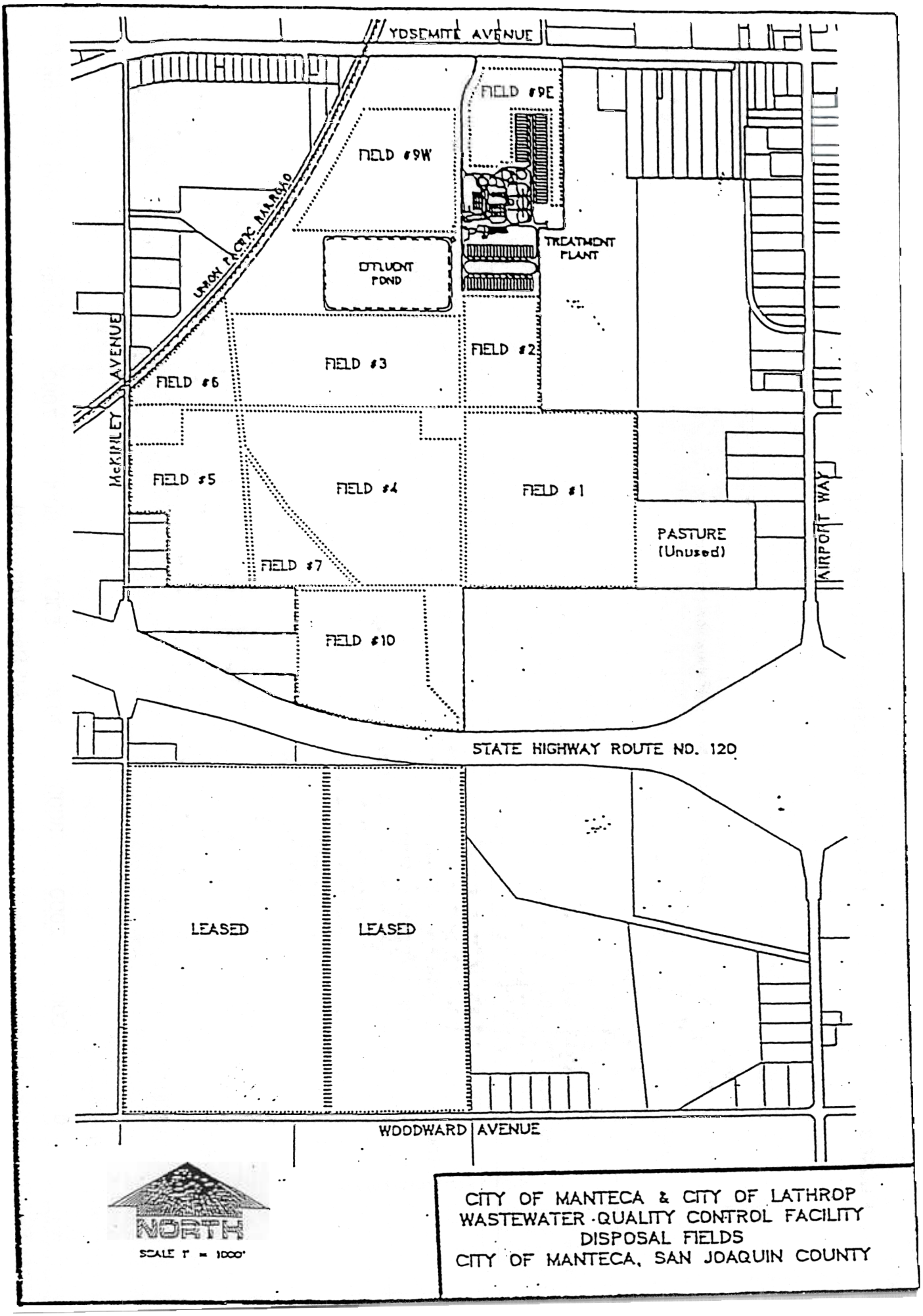
YOSEMITE AVENUE
FIELD #9E
FIELD #9W
UNION PACIFIC RAILROAD
TREATMENT PLANT
EFFLUENT POND
McKINLEY AVENUE
FIELD #3
FIELD #2
FIELD #6
FIELD #5
FIELD #4
FIELD #1
AIRPORT WAY
PASTURE (Unused)
FIELD #7
FIELD #10
STATE HIGHWAY ROUTE NO. 120
LEASED
LEASED
WOODWARD AVENUE
NORTH
SCALE 1" = 1000'
CITY OF MANTECA & CITY OF LATHROP
WASTEWATER QUALITY CONTROL FACILITY
DISPOSAL FIELDS
CITY OF MANTECA, SAN JOAQUIN COUNTY

FIGURE 3

BACKGROUND RECEIVING WATER HARDNESS VS. RIVER FLOW

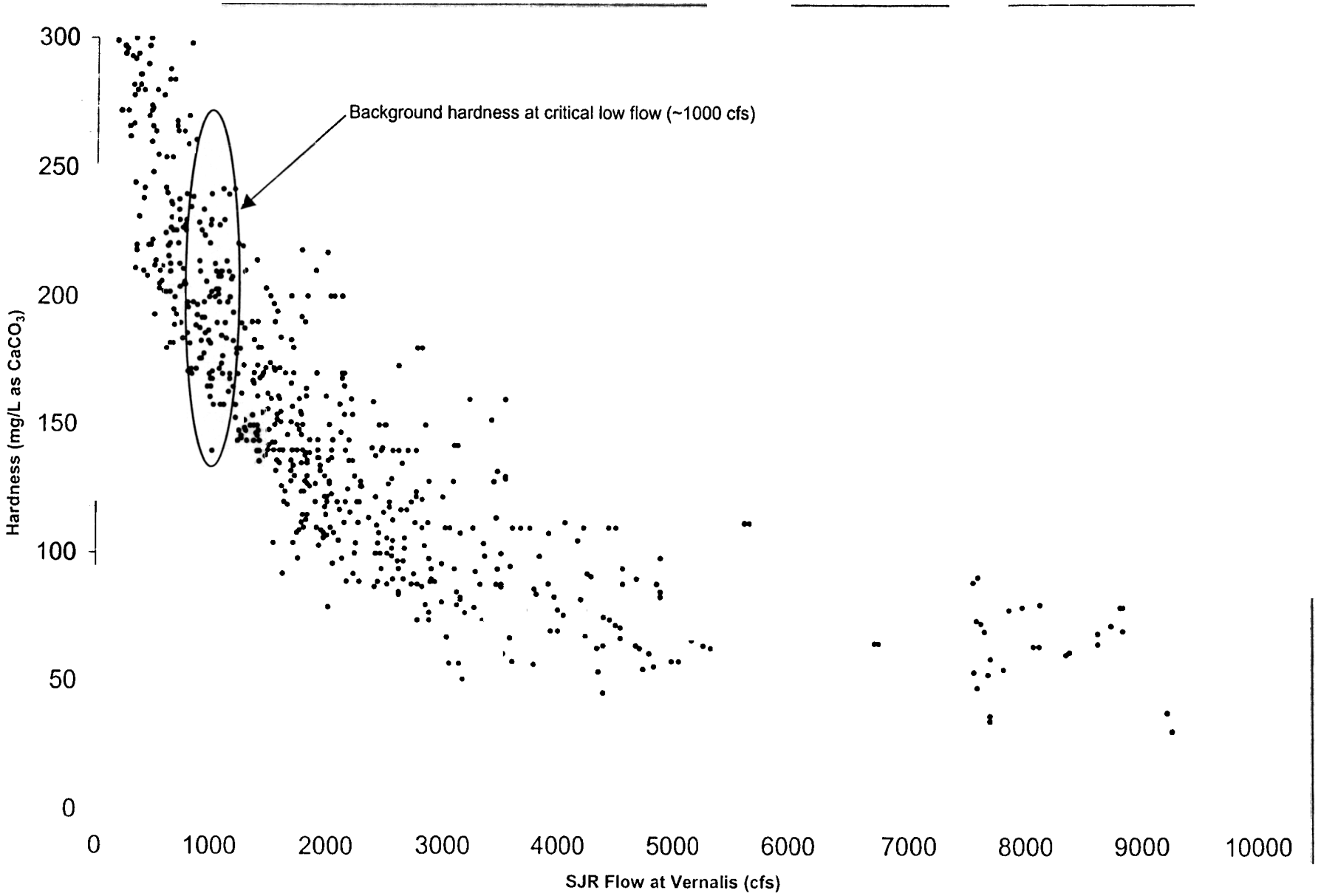

TABLE 1

DEGRADATION ANALYSIS
(for discharge to the San Joaquin River)

Compound	Units	Average Background Concentration	Monthly Average Discharge Concentration[4]	Mass (lb/day)[2]	Monthly Average Permit Limit	Mass (lb/day)[3]	% change
NUTRIENT LOAD							
BOD	mg/L		20	1,200	10	820	-32
TSS	mg/L		20	1,200	10	820	-32
Coliform	mpn/100 ml		23		2.2		
INORGANICS[1]							
Ammonia	mg/L	0.21	17.7	1,000	2.8	230	-77
EC	umhos	686	1099		1000		
Aluminum	ug/L	968	150	8.7	71	5.8	-33
Iron	mg/L	1.64	0.43	25	0.3	25	0
Manganese	ug/L	147	43	2.5	50	4.1	65
Arsenic	ug/L	3	13	0.75	10	0.82	9
Copper	ug/L	3	9	0.52	7.9	0.65	25
Cyanide	ug/L	1.4	7	0.41	3.7	0.30	-25
HUMAN HEALTH							
Dibromochloromethane	ug/L	0.3	0.47	0.03	1.4	0.12	320
Bromodichloromethane	ug/L	0.2	1.98	0.11	5	0.41	260
2,4,6-Trichlorophenol	ug/L	0.2	3.28	0.19	34	2.8	1400
Bis(2-ethylhexyl)phthalate	ug/L	0.3	3.48	0.20	22	1.8	800
BIOACCUMULATIVES							
Mercury	ug/L	0.006	0.019	0.0011		0.0019	70

Note:
1. Unless noted otherwise, all inorganic concentrations are expressed as total recoverable.
2. At 6.95 mgd, the maximum permitted flow before improvements are completed.
3. At 9.87 mgd, the maximum permitted flow after improvements are completed. Mercury is calculated at 8.11 mgd, the maximum current permitted flow.
4. BOD, TSS, and coliform reflect permit limitations from Order # 5-01-007. The remaining constituents are calculated from monitoring data.

TABLE 2 **1Q10, 7Q10, AND 30Q10 CALCULATIONS**

Vernalis 1Q10, 7Q10, and 30Q10 (1980-2002)

Unit of flow is cubic feet per second (CFS)

Year	Yearly Daily Avg. Min. Flow	Log10	Yearly 7-day Avg. Min. Flow	Log10	Yearly Monthly Avg. Min. Flow	Log10
1980	1760	3.245512668	1814	3.258637283	1969	3.294245716
1981	1030	3.012837225	1080	3.033423755	1181	3.072249898
1982	2460	3.390935107	3146	3.497758718	3889	3.589837943
1983	8010	3.903632516	8264	3.917190309	9035	3.955928157
1984	1710	3.23299611	1783	3.251151343	1904	3.279666944
1985	1280	3.10720997	1443	3.159266331	1748	3.242541428
1986	1740	3.240549248	1916	3.282395505	2060	3.31386722
1987	1120	3.049218023	1144	3.058426024	1278	3.106530854
1988	994	2.997386384	1042	3.017867719	1127	3.051923916
1989	984	2.992995098	1051	3.021602716	1169	3.067814511
1990	685	2.835690571	785	2.894869657	876	2.942504106
1991	436	2.639486489	500	2.698970004	537	2.729974286
1992	390	2.591064607	432	2.635483747	447	2.650307523
1993	1000	3	1147	3.059563418	1510	3.178976947
1994	743	2.870988814	783	2.893761762	867	2.938019097
1995	1310	3.117271296	1486	3.172018809	2250	3.352182518
1996	1790	3.252853031	1819	3.259832699	2034	3.308350949
1997	1560	3.193124598	1623	3.21031852	1756	3.244524512
1998	1810	3.257678575	1940	3.28780173	3290	3.517195898
1999	1790	3.252853031	1889	3.276231958	1688	3.227372442
2000	1519	3.181557774	1626	3.211120541	1954	3.290924559
2001	1171	3.068556895	1264	3.101747074	1340	3.127104798
2002	1000	3	1073	3.030599722	1150	3.06069784
n		23		23		23
Std. Dev.	1489	0.263033168	1547	0.25950094	1734	0.273646727
Mean	1578	3.105843393	1698	3.140436493	1959	3.197510525
CS1		0.745408359		0.787609079		0.55253052
CS2		0.939862713		0.993072317		0.696668917
K		1.339		1.34		1.333
Y10		2.753641981		2.792705234		2.832739438
	1Q10 =	567	7Q10 =	620	30Q10 =	680

Notes:

CS1	Skewness (see eqn. 3.40 on page 181 Hydrology and Flood Plain Analysis, Second Edition, Bedient & Huber)
CS2	Skewness correction to be used for Pearson Type 3 distribution (see eqn. 3.41, Bedient & Huber)
K	Frequency Factor for log Pearson Type 3 Distributions (Table 3.4, pgs. 204-205, Bedient & Huber)
Y10	e.g. log 30Q10

TABLE 3 **NON-PRIORITY POLLUTANT METALS DATA**

Date	Hardness, mg/L		pH		Aluminum, total, ug/L		Aluminum, diss, ug/L		Iron, ug/L		Manganese, ug/L	
	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1
09-Jan-02			6.9	7.6	90	2200			600	2800	24	180
07-Feb-02			7.2	7.7	90	600	30	<10	400	1100	13	110
13-Mar-02	170	210	7.5	8.1	110	1000	30	<10	460	1600	16	130
16-Apr-02	180	80	7.2	8.1	350	700			590	1200	100	90
14-May-02	180	94	7.1	7.8	130	900	50	<20	350	1300	120	82
13-Jun-02	190	190	7.3	9.2	140	420	20	<10	730	780	25	96
09-Jul-02	190	220	7.5	9	70	1300	<50	<10	520	2200	48	220
06-Aug-02	200	200	6.9	8.8	90	1000			330	1700		
03-Sep-02	190	170	6.8	8.6	250	800			170	1900	51	200
01-Oct-02	188	172	6.8	7.5	80	600			240	1300	33	140
12-Nov-02	180	160	6.5	6	120	1400			320	2600	19	230
11-Dec-02	210	240	6.6	7.4	280	700			420	1200	21	140
Max	210	240	7.5	9.2	350	2200	50	20	730	2800	120	230
Min	170	80	6.5	6	70	420	20	10	170	780	13	82
Average	188	174	7	8	150	968	33		428	1640	43	147
Median	189	181	7	7.95	115	850	30	10	410	1450	25	140
St.Dev	11	52	0.3	2.11	91	483	13		161	625	36	53
N	10	10	12	12	12	12	5	5	12	12	11	11

TABLE 3 **NON-PRIORITY POLLUTANT METALS DATA**

TABLE 4

RECEIVING WATER (R1)
Non-Priority Pollutants

Date	Ammonia as N	Chloride	EC	MBAS	Nitrate as N	Nitrite as N	TDS	Sulfate	pH		Temperature	
									R1	R2	R1	R2
Units	mg/L	mg/L	umhos/cm	ug/L	mg/L	mg/L	mg/L	mg/L	unit	unit	F	F
Detection Limit	0.01	10	10	20	0.2	0.03	20	5				
1/7/2002	0.33		380						7.33		54.5	
1/8/2002									7.3	7.6	53.4	52.5
1/9/2002	0.3	90	670	<20	2.1	0.03	400	89	7.6			
1/9/2002	0.25		583						7.32		50.2	
1/11/2002	0.39		556						7.33		52.2	
1/14/2002	<0.01		742						7.47		51.8	
1/23/2002									7.2	7.5	52.2	47.8
2/5/2002									7.8	7.9	51.8	51.3
2/7/2002	0.2	110	990	<20	4.7	<0.002	560	100	7.7			
2/19/2002									7.5	7.7	55.2	55
3/11/2002									7.69	7.56	60.4	58.6
3/13/2002	0.3	110	1100	<20	4	<0.002	580	130	8.1			
3/26/2002									7.97	8.09	63.5	61.2
4/2/2002									8.44	8.52	72	70.2
4/8/2002	0.18											
4/10/2002	<0.01											
4/12/2002	<0.01											
4/16/2002	<0.01								7.93	8.02	60.8	64.6
4/16/2002	<0.04	56	490	<20	1.5	<0.002	300	57	8.1			
5/7/2002									7.8	7.8	68.9	67.1
5/14/2002	<0.04	51	380	<20	2.2	<0.002	210	53	7.8			
5/21/2002									7.6	7.7	63	62.8
6/5/2002									8.2	8.2	77	75.7
6/13/2002	0.1	120	830	<20	2.2	<0.002	490	90	9.2			
6/19/2002									8.78	8.83	76.1	80.8
7/8/2002	0.25		645						9		73	
7/9/2002			702						9.01	8.87	77.7	77.4
7/9/2002	0.3	90	680	<20	2.9	0.04	410	110	9			
7/10/2002	<0.01		581						9.17		79.5	
7/12/2002	<0.01		565						9.27		77.7	
8/6/2002	0.08		779	<20		<0.002			8.86		79	
8/6/2002			830						8.82	9.82	74.8	75.2
8/16/2002									8.7	8.52	80.8	80.4
9/3/2002	0.2	95	758	<20	3.4	<0.002	420	77	8.56	8.73	78.8	78.3
9/17/2002									7.34	7.92	74.1	72.3
10/1/2002	0.2	100	720	<20	4.7	<0.002	440	87	8.1			
10/1/2002			687						7.51	7.17	66.2	66.6
10/15/2002									7.25	7.56	66.7	65.1
10/29/2002									6.59	6.85	60.3	58.3
11/12/2002	0.2	90	595	<20	1.5	<0.002	390	73	7.33	7.37	60.1	59
11/12/2002	0.68		469						7.85			
11/14/2002			927						7.46			
11/16/2002	1.36		587						7.35			
11/18/2002	<0.01		743						7.82			
11/20/2002	0.25		783						7.91			
11/22/2002	<0.01		514						7.73			
11/25/2002									7.31	7.44	58.5	56.5
12/11/2002	<0.04	170	922	<20	2.2	<0.002	1300	160	7.14	7.12	51.1	50.9
12/11/2002									7.4			
12/23/2002									6.87	7.33	50.9	49.8
1/7/2003									7.32	7.31	51.8	52.3
1/21/2003									6.5	7.1	50.7	50.5
Count	28	11	28	12	11	12	11	11	49	26	34	26
Minimum	0.01	51	380	20	1.5	<0.002	210	53	6.50	6.85	50.2	47.8
Maximum	1.36	170	1100	20	4.7	0.040	1300	160	9.27	9.82	80.8	80.8
Average	0.21	98	686	20	2.9	0.008	500	93	7.86	7.87	64.0	63.1

TABLE 5

REASONABLE POTENTIAL ANALYSIS
Non-Priority Pollutants

Effluent data collected from January 1998 through December 2002

	Chloride	EC	MBAS	Nitrate as N	Nitrite as N	TDS	Sulfate
Units	mg/l	umhos/cm	ug/l	mg/l	mg/l	mg/l	mg/l
Detection Limit	10	10	20	0.2	0.03	20	5
Count	16	18	12	245	12	36	16
Concentrations							
Minimum	100.0	819.0	120.0	0.0	0.1	540.0	58.0
Maximum	230.0	1300.0	1800.0	19.0	1.8	727.0	130.0
Mean	137.7	1098.8	618.3	2.5	0.7	634.2	83.9
Stand. Deviation	32.3	118.6	450.9	3.2	0.6	40.8	20.5
CV	0.23	0.11	0.73	1.28	0.79	0.06	0.24
RP factor 99%	1.4	1.2	3.4	4.5	3.7	1.2	1.5
Dilution Ratio	1	1	1	1	1	1	1
RWC	322.0	1560.0	6120.0	85.5	6.7	872.4	195.0
Temp. max, C							
pH max							
Criteria							
CMC, mg/l	860						
CCC, mg/l	230						
Other	106(ag)	1000	500	10	1	450/500	250
Reasonable Potential?	yes	yes	yes	yes	yes	yes	no

Notes:

CV	Coefficient of Variation = standard deviation/mean
RP factor 99%	Reasonable Potential Multiplying Factors: 99% Confidence Level and 99% Probability Basis [Reference: EPA Technical Support Document, Table 3-1]
RWC	Receiving water concentration using mass balance equation = ((max effluent conc.x RP factor)+(dilution ratio-1) x upstream conc.)/dilution ratio [Reference: EPA Technical Support Document, Section 3.3.2 and Box 3-2]
CMC/CCC	Criteria Maximum Concentration/Criteria Continuous Concentration

TABLE 6
Non-Priority Pollutant Effluent Limitations for Protection of Aquatic Life and Human Health

Description	Aluminum		Iron		Manganese		MBAS	
Effluent Concentrations								
Sample Dates - Begin	Jan-02		Jan-02		Jan-02		Jan-02	
Sample Dates - End	Dec-02		Dec-02		Dec-02		Dec-02	
Sample Count	12		12		11		12	
Reporting Limits (ug/l)	10		50		5		20	
Maximum Reported Concentration (ug/l)	350.0		730.0		120.0		1800	
Mean (ug/l)	150.00		428.00		43.00		618	
Std. Deviation (ug/l)	91.00		161.00		36.00		451	
Coefficient of Variation (CV)	0.61		0.38		0.84		0.73	
Background Concentrations (R-1)								
Sample Dates - Begin	Jan-02		Jan-02		Jan-02		Jan-02	
Sample Dates - End	Dec-02		Dec-02		Dec-02		Dec-02	
Sample Count	12		12		11		12	
Count Above Reporting Limits	12		12		11		0	
Reporting Limits (ug/l)	10		100		5		20	
Maximum Reported Concentration (ug/l)	2200.0		2800.0		230.0		< 20	
Mean (ug/l)	968		1640		147		< 20	
Criteria [1]	acute	chronic	health		health		health	
Criteria (ug/l)	750	87	300		50		500	
Effluent Limit Calculations [7]								
Dilution Credit	0	0	0		0		0	
Effluent Concentration Allowance [2] (ug/l)	750.00	87.00	300.00		50		500	
$\sigma^2$and σ_4^2	0.313	0.088	0.132	0.035	0.531	0.161	0.427	0.125
σ_{30}^{2} [3]	--	0.0122	0.0047		0.0231		0.0176	
ECA Multiplier [4]	0.32	0.52						
Long-Term Average [5]	238.6	45.60						
AMEL Multiplier [6]	*	1.56	1.34		1.79		1.68	
Average Monthly Effluent Limit (ug/l)	*	**71**	**300**		**50**		**500**	
MDEL Multiplier [6]	*	3.14						
Max. Daily Effluent Limit (ug/l)	*	**143**						

General Note: Unless noted otherwise, all concentrations given as mg/l Ammonia-Nitrogen.
(1) Using CMC and CCC values for Al; Basin Plan and secondary MCLs for the health based constituents.
(2) Allows for dilution consideration, and is similar to the approach in Section 1.4.B, Step 2 of SIP.
(3) Calculated considering daily sampling frequency, Section 5.4.1 of EPA Technical Support Document.
(4) Acute and Chronic ECA Multiplier calculated at 99th percentile level per Sections 5.4.1 and 5.5.4 of TSD.
(5) LTA_c modified to meet 1999 Update recommendation.
(6) The probability basis for AMEL is 95th percentile level and for MDEL is 99th percentile level per Section 5.5.4 of TSD.
(7) Calculated per Section 5.4.1 of TSD for aquatic life protection and Section 5.4.4 of TSD for the protection of human health.
* = Not applicable as other criteria LTA is more stringent.

TABLE 7 REASONABLE POTENTIAL ANALYSIS FOR AMMONIA

Effluent data collected from January 1998 through December 2002

	Effluent ammonia data		Receiving Water ammonia data	
Time	Past 5 years		2002	
Detection Limit	0.1 mg/L		0.01 mg/L	
Count	516		28	
Concentrations (NH3-N)				
Minimum, mg/l	0.0		0.01	
Maximum, mg/l	42.8		1.4	
Mean, mg/l	17.7		0.2	
Stand. Deviation, mg/l	7.4		0.3	
CV	0.42		1.3	
RP factor 99%	1.8		4.5	
	acute	chronic	acute	chronic
Dilution Ratio	1	4	1	1
RWC, mg/l	77.0	20.3	6.1	6.1
Temperature max, C		25.7 (3)		25.7 (3)
pH max	8 (1)	9.1 (3)	9.3 (2)	9.1 (3)
Criteria				
CMC, mg/l	5.6		0.58	
CCC, mg/l		0.21		0.21
Reasonable Potential	yes	yes	yes	yes

Notes:

CV	Coefficient of Variation = standard deviation/mean
RP factor 99%	Reasonable Potential Multiplying Factors: 99% Confidence Level and 99% Probability Basis [Reference: EPA Technical Support Document, Table 3-1]
RWC	Receiving water concentration using mass balance equation = ((max effluent conc.x RP factor)+(dilution ratio-1) x upstream conc.)/dilution ratio [Reference: EPA Technical Support Document, Section 3.3.2 and Box 3-2]
CMC	Criteria Maximum Concentration
CCC	Criteria Continuous Concentration
(1)	Maximum permitted effluent concentration
(2)	Maximum receiving water pH at R-1 (See Table 4)
(3)	Maximum monthly average pH and temperature at Mossdale Landing DWR monitoring station

TABLE 8 SEASONAL EFFLUENT LIMITATIONS FOR AMMONIA

Description	Ammonia		Ammonia	
Season	June 1 to September 30		October 1 to May 31	
Effluent Concentrations (NH3-N)				
Sample Dates - Begin	Jan-98		Jan-98	
Sample Dates - End	Dec-02		Dec-02	
Sample Count	516		516	
Reporting Limits (mg/l)	0.1		0.1	
Maximum Reported Concentration (mg/l)	42.8		42.8	
Mean (mg/l)	17.70		17.70	
Std. Deviation (mg/l)	7.40		7.40	
Coefficient of Variation (CV)	0.42		0.42	
Background Concentrations (R-1)				
Sample Dates - Begin	Jan-02		Jan-02	
Sample Dates - End	Jan-03		Jan-03	
Sample Count	28		28	
Count Above Reporting Limits	17		17	
Reporting Limits (mg/l)	0.01		0.01	
Maximum Reported Concentration (mg/l NH3-N)	1.4		1.4	
Mean (mg/l NH3-N))	0.21		0.21	
Criteria [2]	acute	chronic	acute	chronic
pH [1]	8.0	8.4	8.0	8.2
Temperature ^{0}C	N/A	26	N/A	20.7
Criteria (mg/l ammonia as N)	5.62	0.62	5.62	1.2
Effluent Limit Calculations [9]				
Dilution Credit	0	4	0	4
Effluent Concentration Allowance [3] (mg/l)	5.62	2.24	5.62	5.18
$\sigma^2$and σ_4^2	0.161	0.043	0.161	0.043
σ_{30}^{2} [4]	--	0.0058	--	0.0058
ECA Multiplier [5]	0.43	0.84	0.43	0.84
Long-Term Average [7]	2.4	1.88	2.4	4.35
AMEL Multiplier [8], [6]	*	1.13	1.19	*
Average Monthly Effluent Limit (mg/l)	*	**2.1**	**2.8**	*
MDEL Multiplier [8]	*	2.35	2.35	*
Max. Daily Effluent Limit (mg/l)	*	**4.4**	**5.6**	*

General Note: Unless noted otherwise, all concentrations given as mg/l Ammonia-Nitrogen.

(1) Acute pH = maximum permitted effluent pH. Chronic pH = pH at edge of 4:1 mixing zone as calculated by USEPA DESCON program utilizing maxiumum permitted effluent pH and the maximum monthly average pH from Mossdale monitoring station (DWR-ESO-D1485C, RSAN087) for Jan. 1984 to Sept. 2002.

(2) Using CMC and CCC values.

(3) Allows for dilution consideration, and is similar to the approach in Section 1.4.B, Step 2 of SIP.

(4) Calculated considering daily sampling frequency, Section 5.4.1 of EPA Technical Support Document.

(5) Acute and Chronic ECA Multiplier calculated at 99th percentile level per Sections 5.4.1 and 5.5.4 of TSD.

(6) Assumes sampling frequency is 30 times per month.

* = Not applicable as other criteria LTA is more stringent.

(7) LTA_c modified to meet 1999 Update recommendation.

(8) The probability basis for AMEL is 95th percentile level and for MDEL is 99th percentile level per Section 5.5.4 of TSD.

(9) Calculated per Section 5.4.1 of TSD for aquatic life protection.

TABLE 9

PRIORITY POLLUTANT DATA TABLES

Date	Hardness		pH		Cu, total		Cu, diss		Cyanide	
	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1
Units	mg/L	mg/L	unit	unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
09-Jan-02			6.9	7.6	7.4	6.1			6	3
07-Feb-02			7.2	7.7	8.3	2.7	7.6	1.6	6	5
13-Mar-02	170	210	7.5	8.1	8.6	3.5	7.4	1.8	3	< 0.6
16-Apr-02	180	80	7.2	8.1	10	2.8	9	< 2	1.5 (<3)	< 0.6
14-May-02	180	94	7.1	7.8	9.1	2.7	8.1	1.3	5	< 0.6
13-Jun-02	190	190	7.3	9.2	12	2.6	11	1.8	6	< 0.8
09-Jul-02	190	220	7.5	9	8.9	4.2	8	4.7	10	< 0.8
06-Aug-02	200	200	6.9	8.8	7.6	3.6	7.3	1.9	31	< 0.9
03-Sep-02	190	170	6.8	8.6	12	3	9.7	1.9	1.7 J	1.4 J
01-Oct-02	188	172	6.8	7.5	8.5	2.7	7.6	1.8	3	< 0.9
12-Nov-02	180	160	6.5	6	8	4.8	6.8	2.2	3	< 0.9
11-Dec-02	210	240	6.6	7.4	13	2.9	12	1.7	5	< 0.9
Max (1)	210	240	7.5	9.2	13	6.1	12	4.7	31	5
Min	170	80	6.5	6	7.4	2.6	6.8	1.3	1.5	0.6
Mean (2)	188	174	7	8	9	3	9	2	7	1.4
St.Dev	11	52	0.33	0.87	1.88	1.08	1.66	0.90	7.99	1.32
Coeff. Var.	0.060	0.298	0.047	0.109	0.199	0.311	0.194	0.438	1.180	0.965
N	10	10	12	12	12	12	11	11	12	12

(1) Maximum of Background (R-1) calculated per Section 1.4.3.1, Step 2 of the SIP
(2) Arithmetic mean of Background (R-1) calculated per Section 1.4.3.2, Step 2 of the SIP

TABLE 9

PRIORITY POLLUTANT DATA TABLES

Date	Arsenic, total		Arsenic, diss		Chloroform		Dibromochloromethane		Bromodichloromethane	
	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1	effluent	R-1
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
09-Jan-02	13	2.9			4	< 0.3	0.7	< 0.3	2.2	< 0.2
07-Feb-02	11	2	11	2	4.5	< 0.3	< 0.3	< 0.3	1.3	< 0.2
13-Mar-02	11	2.6	12	1.9	6.1	< 0.3	< 0.3	< 0.3	1	< 0.2
16-Apr-02	13	1.9	14	0.003	7	< 0.3	< 0.3	< 0.3	1	< 0.2
14-May-02	14	1.9	14	1.3	8.3	< 0.3	0.5	< 0.3	2.8	< 0.2
13-Jun-02	14	3	13	2.3	11	< 0.3	0.3 J	< 0.3	2.3	< 0.2
09-Jul-02	13	3	13	2.8	7.5	< 0.3	1.2	< 0.3	3.5	< 0.2
06-Aug-02	12	3.5	13	3.1	8.1	< 0.3	0.4 J	< 0.3	2.2	< 0.2
03-Sep-02	13	3.1	13	2.9	12	< 0.3	< 0.3	< 0.3	1.4	< 0.2
01-Oct-02	12	2.7	13	1.9	5.7	< 0.3	< 0.3	< 0.3	1.7	< 0.2
12-Nov-02	12	2.8	12	1.5	8.5	< 0.3	< 0.3	< 0.3	1.4	< 0.2
11-Dec-02	12	2.6	12	1.5	7.8	< 0.3	0.7	< 0.3	3	< 0.2
Max (1)	14	3.5	14	3.1	12	0.3	1.2	0.3	3.5	0.2
Min	11	1.9	11	0.003	4	0.3	0.28	0.3	1	0.2
Mean (2)	13	3	13	2	8	0.3	0.5	0.3	2.0	0.2
St.Dev	1.00	0.51	0.90	0.88	2.36	0.00	0.28	0.00	0.82	0.00
Coeff. Var.	0.080	0.189	0.071	0.455	0.313		0.599		0.412	
N	12	12	11	11	12	12	12	12	12	12

(1) Maximum of Background (R-1) calculated per Section 1.4.3.1, Step 2 of the SIP
(2) Arithmetic mean of Background (R-1) calculated per Section 1.4.3.2, Step 2 of the SIP

TABLE 9

PRIORITY POLLUTANT DATA TABLES

Date	2,4,6-Trichlorophenol effluent	2,4,6-Trichlorophenol R-1	Carbofuran effluent	Carbofuran R-1	Bis(2-ethylhexyl)phthalate effluent	Bis(2-ethylhexyl)phthalate R-1
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
09-Jan-02	< 0.6	< 0.2	2.9 J		2.0 J	< 0.3
07-Feb-02						
13-Mar-02						
16-Apr-02	11	< 0.8	2.7 J	2.5 J	7	< 0.3
14-May-02						
13-Jun-02						
09-Jul-02	0.9 J	< 0.6	0.7 (<1.3)	0.7 (<1.3)	4	< 0.8
06-Aug-02						
03-Sep-02						
01-Oct-02	< 0.6	< 0.6	0.7 (<1.3)	0.7 (<1.3)	0.9 J	< 0.8
12-Nov-02						
11-Dec-02						
07-Jan-03			0.7 (<1.3)	1.84		
Max (1)	11	0.2	2.9	2.5	7	0.3
Min	0.6	0.2	0.65	0.65	0.9	0.3
Mean (2)	3.3	0.2	1.5	1.4	3.5	0.3
St.Dev	5.15	0.25	1.17	0.91	2.68	0.29
Coeff. Var.	1.573		0.780	0.649	0.771	
N	4	4	5	5	4	4

(1) Maximum of Background (R-1) calculated per Section 1.4.3.1, Step 2 of the SIP
(2) Arithmetic mean of Background (R-1) calculated per Section 1.4.3.2, Step 2 of the SIP

TABLE 10 **SUMMARY OF REASONABLE POTENTIAL ANALYSIS FOR METALS AND ORGANICS**

Compound	Units	MEC	B	CMC	CCC	Water & Org	Org. Only	BP/MCL [1]	Special Cond.	Reasonable Potential?
INORGANICS										
Aluminum	ug/L	350	2200	750	87			200(mcl)	60[3]	**Yes**, MEC>C & B > C
Chromium(VI)	ug/L	0.6	0.4	16	11			50(mcl)	0.2[3]	No
Iron	mg/L	0.73	2.8					0.3(mcl)		**Yes**, MEC>C & B > C
Manganese	ug/L	120	230				100	50(mcl)		**Yes**, MEC>C & B > C
Silver	ug/L	3.2	0.02	8.6[2]				10/100(mcl)		No
Zinc	ug/L	42	9	48[2]	49[2]			100		No
Lead	ug/L	1.3	1.2	180[2]	170[2]			15 (mcl)	2 [3]	No
Arsenic	ug/L	14	3.5	340	150			10/10(mcl)	0.023 [3]	**Yes**, MEC > C
Copper	ug/L	13	6.1	22	7.4	1300		10.4[4]		**Yes**, MEC > C
Cyanide	ug/L	31	5	22	5.2	700	220,000	10		**Yes**, MEC > C
HUMAN HEALTH										
1,4-Dichlorobenzene	ug/L	0.8	<0.5	--	--	400	2,600	5(mcl)		No
Toluene	ug/L	0.7	<0.5	--	--	6,800	200,000	150 (mcl)		No
Chloroform	ug/L	12	<0.3	--	--			80(mcl)	1.1 [3]	No
Chloromethane	ug/L	1.7	<0.5	11,000					3	No
Dichloromethane	ug/L	0.6	<0.5	--	--	4.7	1,600	5 (mcl)	4 [3]	No
Dibromochloromethane	ug/L	1.2	<0.3	--	--	0.41	34	80(mcl)	0.37 [3]	**Yes**, MEC > C
Bromodichloromethane	ug/L	3.5	<0.2	--	--	0.56	46	80(mcl)	0.27 [3]	**Yes**, MEC > C
Trihalomethane	ug/L	16.7	0.3					80(mcl)		No
2,4,6-Trichlorophenol	ug/L	11	<0.2	--	--	2.1	6.5		0.5[3]	**Yes**, MEC > C
MTBE	ug/L	0.7	<0.5	--	--			5 (mcl)	19[3]	No
Carbofuran	ug/L	2.9 J	2.5 J	--	--			18(mcl)	1.7[3]	**Yes**, MEC>C & B > C
Bis(2-ethylhexyl)phthalate	ug/L	7	<0.3	--	--	1.8	5.9	4 (mcl)		**Yes**, MEC > C
BIOACCUMULATIVES										
Mercury	ug/L	0.028	0.0093	reserved	reserved	0.05	0.051	2 (mcl)	1.2[3], 303d	No
Endrin Aldehyde	ug/L	<0.02	<0.01	0.086 [5]	0.036 [5]	0.76	0.81	2 (mcl), ND	BP objective	No
Lindane	ug/L	<0.02	<0.01	0.95	--	0.019	0.063	0.2 (mcl), ND	BP objective	No
4,4'-DDT	ug/L	<0.02	<0.01	1.1	0.001	0.00059	0.00059	ND	BP objective	No
PCBs	ug/L	<0.1	<0.1	--	0.014	0.00017	0.00017	0.5 (mcl)	303d	No
2,3,7,8-TCDD	pg/L	<0.8	<0.6	--	--	0.013	0.014		303d	No

General Note: Unless noted otherwise, all inorganic concentrations are given as total revoverable.
MEC = Maximum Effluent Concentration (lowest detection level or maximum reported concentration).
B = Background (lowest detection level or maximum reported concentration).
C = Criterion (From California Toxics Rule unless otherwise noted)
NS = Not Sampled
BP = Basin Plan
J = Detected but not quantified. Detection limit = 5 ug/L.
(1) = Basin Plan Objective unless designated as MCL as (mcl).
(2) = concentration expressed as **dissolved** metals
(3) = California OEHHA Public Health Goal for Drinking Water
(4) = Concentration converted to total recoverable using EPA default translator (0.96)
(5) = Criteria as Endrin.

TABLE 11
Priority Pollutant Effluent Limitations

Description	copper		cyanide		arsenic		
Effluent Concentrations							
Sample Dates - Begin	Jan-02		Jan-02		Jan-02		
Sample Dates - End	Dec-02		Dec-02		Dec-02		
Sample Count	12		12		12		
Count Above Reporting Limits	12		11		12		
% of Samples Above Reporting Limits	100.0		91.7		100.0		
Reporting Limits (µg/l)	0.5		3		0.5		
Maximum Reported Concentration (µg/l)	13		31.0		14.0		
Mean (µg/l)	9.0		7.0		12.5		
Std. Deviation (µg/l)	1.9		8.0		1.0		
Coefficient of Variation (CV) (µg/l)	0.20		1.18		0.08		
Background Concentrations							
Sample Dates - Begin	Jan-02		Jan-02		Jan-02		
Sample Dates - End	Dec-02		Dec-02		Dec-02		
Sample Count	12		12		12		
Count Above Reporting Limits	12		3		12		
Reporting Limits (µg/l)	0.5		0.6		0.5		
Maximum Reported Concentration (µg/l)	6.1		5.0		3.5		
Mean (µg/l)	3.0		1.0		3.0		
Criteria	acute	chronic	acute	chronic	acute	chronic	health
Hardness (mg/l as $CaCO_3$)	170.0	108.0	----	----	----	----	
CTR Criteria[(1)] (µg/l)	22.2	9.6	22	5.2	750	340	
Basin Plan Objective (µg/l)[(2)]	10		10				10
Translator [(3)]	0.96	0.96	n/a	n/a	n/a	n/a	n/a
Criteria (µg/l, total recoverable)[(4)]	10.4	10.0	10	5.2	750	340	10
Effluent Limit Calculations							
Dilution Credit	0	4	0	4	0	0	0
Effluent Concentration Allowance [(5)] (µg/l)	10.4	25.4	10.00	6.00	750.00	340.00	10
$\sigma^2$and σ_4^2	0.04	0.01	0.87	0.30	0.006	0.002	
ECA Multiplier [(6)]	0.64	0.80	0.18	0.33	0.83	0.91	
Long-Term Average	6.7	20.3	1.8	2.0	624.8	310.1	
AMEL Multiplier [(7)(8)]	1.2	*	2.1	*	*	*	
Average Monthly Effluent Limit	**7.9**	*	**3.7**	*	*	*	**10.0**
MDEL Multiplier [(9)]	1.6	*	5.7	*	*	*	
Max. Daily Effluent Limit	**10.4**	*	**10.0**	*	*	*	

General Note: Unless noted otherwise, all concentrations given as total recoverable.
(1) Cu and As criteria are dissolved concentrations. Cyanide criteria are total concentrations.
(2) Metals are expressed as dissolved concentrations. Cyanide is expressed as total concentration.
(3) EPA Translators used as default.
(4) The total recoverable criteria is based on either the Basin Plan Objective or CTR, whichever is lower.
(5) ECA calculated per Section 1.4.B, Step 2 of SIP. This allows for the consideration of dilution.
(6) Acute and Chronic ECA Multiplier calculated at 99th percentile per Section 1.4.B, Step 3 of SIP or per Sections 5.4.1 and 5.5.4 of the TSD.
(7) Assumes sampling frequency n=>4.
(8) The probability basis for AMEL is 95th percentile per Section 1.4.B, Step 5 of SIP or Section 5.5.4 of the TSD.
(9) The probability basis for MDEL is 99th percentile per Section 1.4.B, Step 5 of SIP or Section 5.5.4 of the TSD.
* = Not applicable as other criteria LTA is more stringent.

TABLE 12 SUMMARY OF HUMAN CARCINOGENIC POLLUTANT STATISTICS

Sample Date (Concentations in ug/l)	Dibromochloromethane	Bromodichloromethane	2,4,6-Trichlorophenol	bis(2-ethylhexyl)phthalate
09-Jan-02	0.7	2.2	< 0.6	2.0 J
07-Feb-02	< 0.3	1.3		
13-Mar-02	< 0.3	1		
16-Apr-02	< 0.3	1	11	7
14-May-02	0.5	2.8		
13-Jun-02	0.3 J	2.3		
09-Jul-02	1.2	3.5	0.9 J	4
06-Aug-02	0.4 J	2.2		
03-Sep-02	< 0.3	1.4		
01-Oct-02	< 0.3	1.7	< 0.6	0.9 J
12-Nov-02	< 0.3	1.4		
11-Dec-02	0.7	3		

Sample Count	12	12	4	4
Max. Concentration (µg/l)	1.20	3.50	11.00	7.00
Mean (µg/l)	0.47	1.98	3.28	3.48
Median (ug/l)	0.3	1.95	0.75	3
Std. Dev.	0.28	0.82	5.15	2.68
CV	0.60	0.41	0.60	0.60
Factor (99th percentile)[1]			3.11	3.11
Estimated Max. Concentration (µg/l)[2]	1.38	4.68	34.21	21.77
Human Health Criteria	0.41	0.56	2.1	1.8
Mean of Reported Background (µg/l) [3]	< 0.3	< 0.2	< 0.2	< 0.3
Needed Dilution Credit[4]	**8.9**	**11.5**	**16.9**	**13.3**

(1) See USEPA TSD Table 5-2.
(2) For 10 samples or more, the estimated maximum concentration is the mean plus 3.3 standard deviations. For less than 10 samples, the estimated maximum concentration is the maximum observed concentration times the factor from Table 5-2.
(3) MDL utilized for receiving water detection limit.
(4) Dilution = (Est. max. conc.- HH Criteria)/(HH criteria - background conc.)

TABLE 13
PRIORITY POLLUTANT EFFLUENT LIMITATIONS FOR HUMAN HEALTH

Description	Dibromochloromethane	Bromodichloromethane	2,4,6-Trichlorophenol	Bis(2-ethylhexyl)phthalate
Effluent Concentrations				
Sample Dates - Begin	Jan-02	Jan-02	Jan-02	Jan-02
Sample Dates - End	Dec-02	Dec-02	Oct-02	Oct-02
Sample Count	12	12	4	4
Count Above Reporting Limits	6	12	2	4
% of Samples Above Reporting Limits	50.0	100.0	50.0	100.0
Reporting Limits (µg/l)	0.3	0.2	0.6	0.3
Maximum Reported Concentration (µg/l)	1.2	3.5	11.0	7.0
Mean [1] (µg/l)	0.5	2.0	3.3	3.5
Std. Deviation [1] (µg/l)	0.28	0.82	5.2	2.7
Coefficient of Variation [1] (CV) (µg/l)	0.60	0.41	0.60	0.60
Background Concentrations				
Sample Dates - Begin	Jan-02	Jan-02	Jan-02	Jan-02
Sample Dates - End	Dec-02	Dec-02	Oct-02	Oct-02
Sample Count	12	12	4	4
Count Above Reporting Limits	0	0	0	0
Reporting Limits (µg/l)	0.3	0.2	0.2	0.3
Maximum Reported Concentration (µg/l)	< 0.3	< 0.2	< 0.2	< 0.3
Arithmetic mean (µg/l)[2]	< 0.3	< 0.2	< 0.2	< 0.3
Criteria	health	health	health	health
Basin Plan Objective (µg/l, dissolved)				
Translator [3]	n/a	n/a	n/a	n/a
Criteria (µg/l, total recoverable)[4]	0.41	0.56	2.1	1.8
Effluent Limit Calculations				
Dilution Credit[5]	8.9	11.5	16.9	13.3
Effluent Concentration Allowance [6] (µg/l)	1.389	4.7	34.21	21.75
σ^2 and σ_4^2	0.30 / 0.09	0.16 / 0.04	0.31 / 0.09	0.31 / 0.09
AMEL Multiplier [7]	1.5	1.4	1.6	1.6
Average Monthly Effluent Limit (ug/l)	**1.4**	**5**	**34**	**22**
MDEL Multiplier [8]	3.1	2.3	3.1	3.1
Max. Daily Effluent Limit (ug/l)	**2.8**	**8**	**69**	**44**

General Note: Unless noted otherwise, all concentrations given as total recoverable
(1) Calculated per Section 1.4.B, Step 3 of SIP.
(2) Calculated per Section 1.4.3.2 of SIP
(3) EPA Translators used as default.
(4) The total recoverable criteria is based on the CTR.
(5) See Table 12 for applicable dilution credit for human carcinogenic pollutants.
(6) ECA calculated per Section 1.4.B, Step 2 of SIP.
(7) Assumes sampling frequency n=>4. Uses 95th percentile AMEL multiplier, Step 5 of SIP.
(8) Uses 99th percentile MDEL multiplier, Step 5 of SIP.

TABLE 14 **MERCURY LOADING**

Date	Mercury effluent (ug/L)	R-1 (ug/L)
09-Jan-02	0.015	0.0093
07-Feb-02	0.014	0.0053
13-Mar-02	0.019	0.0075
16-Apr-02	0.021	0.0045
14-May-02	0.016	0.0048
13-Jun-02	0.028	0.0036
09-Jul-02	0.017	0.008
06-Aug-02	0.017	0.0054
03-Sep-02	0.027	0.0045
01-Oct-02	0.021	0.0045
12-Nov-02	0.013	0.0056
11-Dec-02	0.022	0.004
Maximum	0.028	0.009
Minimum	0.013	0.004
Mean	0.019	0.006
Median	0.018	0.005
Standard Deviation	0.005	0.002
Coefficient of Variation	0.252	0.315
Number of samples	12	12

Design Flow (mgd)	8.11
Maximum Observed Concentration (ug/l)	0.028
Daily Mass Loading (lbs)	0.00189
Yearly Mass Loading (lbs)	**0.69**

CITY OF MANTECA, CITY OF LATHROP AND DUTRA FARMS
WASTEWATER QUALITY CONTROL FACILITY
SAN JOAQUIN COUNTY

ATTACHMENT B

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Guidelines for the Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water

March 2001

DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT
DRINKING WATER PROGRAM
RECYCLED WATER UNIT

GUIDELINES FOR THE PREPARATION OF AN ENGINEERING REPORT FOR THE PRODUCTION, DISTRIBUTION AND USE OF RECYCLED WATER

March 2001
(Replaces September 1997 Version)

1.0 INTRODUCTION

The current State of California Water Recycling Criteria (adopted in December 2000) require the submission of an engineering report to the California Regional Water Quality Control Board (RWQCB) and the Department of Health Services (DHS) before recycled water projects are implemented. These reports must also be amended prior to any modification to existing projects. The purpose of an engineering report is to describe the manner by which a project will comply with the Water Recycling Criteria. The Water Recycling Criteria are contained in Sections 60301 through 60355, inclusive, of the California Code of Regulations, Title 22. The Criteria prescribe:

* Recycled water quality and wastewater treatment requirements for the various types of allowed uses,

* Use area requirements pertaining to the actual location of use of the recycled water (including dual plumbed facilities), and

* Reliability features required in the treatment facilities to ensure safe performance.

Section 60323 of the Water Recycling Criteria specifies that the engineering report be prepared by a properly qualified engineer, registered in California and experienced in the field of wastewater treatment.

Recycled water projects vary in complexity. Therefore, reports will vary in content, and the detail presented will depend on the scope of the proposed project and the number and nature of the agencies involved in the production, distribution, and use of the recycled water. The report should contain sufficient information

to assure the regulatory agencies that the degree and reliability of treatment is commensurate with the requirements for the proposed use, and that the distribution and use of the recycled water will not create a health hazard or nuisance.

The intent of these guidelines is to provide a framework to assist in developing a comprehensive report which addresses all necessary elements of a proposed or modified project. Such a report is necessary to allow for the required regulatory review and approval of a recycled water project.

References which may assist in addressing various project elements include:

- State of California Water Recycling Criteria (December 2000)
- State of California Regulations Relating to Cross-Connections
- California Waterworks Standards
- California Water Code
- Guidelines for the Distribution of Non-potable Water, (California-Nevada Section-AWWA, 1992)
- Guidelines For The On-Site Retrofit of Facilities Using Disinfected Tertiary Recycled Water (California-Nevada Section-AWWA, 1997)
- Manual of Cross-Connection Control/Procedures and Practices (DOHS)
- Ultraviolet Disinfection – Guidelines for Drinking Water and Water Reuse (NWRI/AWWARF, December 2000)

2.0 RECYCLED WATER PROJECT

The following sections discuss the type of information that should be presented and described in the engineering report. Some sections may be applicable only to certain types of uses.

2.1 General

The report shall identify all agencies or entities that will be involved in the design, treatment, distribution, construction, operation and maintenance of the recycled facilities, including a description of any legal arrangements outlining authorities and responsibilities between the

agencies with respect to treatment, distribution and use of recycled water. In areas where more than one agency/entity is involved in the reuse project, a description of arrangements for coordinating all reuse-related activities (e.g. line construction/repairs) shall be provided. An organizational chart may be useful.

2.2 Rules and Regulations

The procedures, restrictions, and other requirements that will be imposed by the distributor and/or user should be described. In multiple projects covered under a Master Permit issued by the Regional Boards where the reuse oversight responsibility is delegated to the distributor and/or user, the requirements and restrictions should be codified into a set of enforceable rules and regulations. The rules and regulations should include a compliance program to be used to protect the public health and prevent cross connections. Describe in the report the adoption of enforceable rules and regulations that cover all of the design and construction, operation and maintenance of the distribution systems and use areas, as well as use area control measures. Provide a description of the organization of the agency or agencies who has the authority to implement and enforce the rules and regulations, and the responsibilities of pertinent personnel involved in the reuse program. Reference to any ordinances, rules of service, contractual arrangements, etc. should be provided.

2.3 Producer – Distributor - User

The producer is the public or private entity that will treat and/or distribute the recycled water used in the project. Where more than one entity is involved in the treatment or distribution of the recycled water, the roles and responsibilities of each entity (i.e. producer, distributor, user) should be described.

2.4 Raw Wastewater

Describe the chemical quality, including ranges with median and 95th percentile values;

Describe the source of the wastewater to be used and the proportion and types of industrial waste, and

Describe all source control programs.

2.5 Treatment Processes

Provide a schematic of the treatment train;

Describe the treatment processes including loading rates and contact times;

All filtration design criteria should be provided (filtration and backwash rates, filter depth and media specifications, etc.). The expected turbidities of the filter influent (prior to the addition of chemicals) and the filter effluent should be stated;

State the chemicals that will be used, the method of mixing, the degree of mixing, the point of application, and the dosages. Also describe the chemical storage and handling facilities, and

Describe the operation and maintenance manuals available.

2.6 Plant Reliability Features

The plant reliability features proposed to comply with Sections 60333 - 60355 of the Water Recycling Criteria should be described in detail. The discussion of each reliability feature should state under what conditions it will be actuated. When alarms are used to indicate system failure, the report should state where the alarm will be received, how the location is staffed, and who will be notified. The report should also state the hours that the plant will be staffed.

2.7 Supplemental Water Supply

The report should describe all supplemental water supplies. The description should include:

* Purpose

* Source

* Quality

* Quantity available

* Cross-connection control and backflow prevention measures

2.8 Monitoring and Reporting

The report should describe the planned monitoring and reporting program, including all monitoring required by the Water Recycling Criteria, and include the frequency and location of sampling. Where continuous analysis and recording equipment is used, the method and frequency of calibration

should be stated. All analyses shall be performed by a laboratory approved by the State Department of Health Services.

2.9 Contingency Plan

Section 60323 (c) of the Water Recycling Criteria requires that the engineering report contain a contingency plan designed to prevent inadequately treated wastewater from being delivered to the user. The contingency plan should include:

* A list of conditions which would require an immediate diversion to take place;

* A description of the diversion procedures;

* A description of the diversion area including capacity, holding time and return capabilities;

* A description of plans for activation of supplemental supplies (if applicable);

* A plan for the disposal or treatment of any inadequately treated effluent;

* A description of fail safe features in the event of a power failure, and

  A plan (including methods) for notifying the recycled water user(s), the regional board, the state and local health departments, and other agencies as appropriate, of any treatment failures that could result in the delivery of inadequately treated recycled water to the use area.

3.0 TRANSMISSION AND DISTRIBUTION SYSTEMS

Maps and/or plans showing the location of the transmission facilities and the distribution system layout should be provided. The plans should include the ownership and location of all potable water lines, recycled water lines and sewer lines within the recycled water service area and use area(s).

4.0 USE AREAS

The description of each use area should include:

* The type of land uses;

* The specific type of reuse proposed;

* The party(s) responsible for the distribution and use of the recycled water at the site;

* Identification of other governmental entities which may have regulatory jurisdiction over the re-use site such as the US Department of Agriculture, State Department of Health Services, Food and Drug Branch, the State Department of Health Services, Licensing and Certification Section, etc. These agencies should also be provided with a copy of the Title 22 Engineering Report for review and comment.

* Use area containment measures;

* A map showing:

  -Specific areas of use

  -Areas of public access

  -Surrounding land uses

  -The location and construction details of wells in or within 1000 feet of the use area

  -Location and type of signage

* The degree of potential access by employees or the public;

* For use areas where both potable and recycled water lines exist, a description of the cross-connection control procedures which will be used.

In addition to the general information described above, the following should be provided for the following specific proposed uses:

4.1 Irrigation

-Detailed plans showing all piping networks within the use area including recycled, potable, sewage and others as applicable.

-Description of what will be irrigated (e.g. landscape, specific food crop, etc.);

-Method of irrigation (e.g. spray, flood, or drip);

-The location of domestic water supply facilities in or adjacent to the use area;

-Site containment measures;

-Measures to be taken to minimize ponding;

-The direction of drainage and a description of the area to which the drainage will flow;

-A map and/or description of how the setback distances of Section 60310 will be maintained;

-Protection measures of drinking water fountains and designated outdoor eating areas, if applicable;

-Location and wording of public warning signs,

-The proposed irrigation schedule (if public access is included), and

-Measures to be taken to exclude or minimize public contact.

4.2 Impoundments

-The type of use or activity to be allowed on the impoundment;

-Description of the degree of public access;

-The conditions under which the impoundment can be expected to overflow and the expected frequency, and

-The direction of drainage and a description of the area to which the drainage will flow.

4.3 Cooling

-Type of cooling system (e.g. cooling tower, spray, condenser, etc.);

-Type of biocide to be used, if applicable;

-Type of drift eliminator to be used, if applicable, and

-Potential for employee or public exposure, and mitigative measures to be employed.

4.4 Groundwater Recharge

An assessment of potential impacts the proposal will have on underlying groundwater aquifers. The appropriate information

shall be determined through consultation with the Department on a case by case basis.

4.5 Dual Plumbed Use Areas

In accordance with Sections 60313 through 60316 of the Water Recycling Criteria.

4.6 Other Industrial Uses

The appropriate information shall be determined on a case by case basis.

4.7 Use Area Design

The report should discuss how domestic water distribution system shall be protected from the recycled water in accordance with the Regulations Relating to Cross-Connections and the California Waterworks Standards, and how the facilities will be designed to minimize the chance of recycled water leaving the designated use area. Any proposed deviation from the Water Recycling Criteria and necessity therefore, should be discussed in the report.

4.8 Use Area Inspections and Monitoring

The report should describe the use area inspection program. It should identify the locations at the use area where problems are most likely to occur (e.g. ponding, runoff, overspray, cross-connections, etc.) and the personnel in charge of the monitoring and reporting of use area problems.

4.9 Employee Training

The report should describe the training which use area employees will receive to ensure compliance with the Recycled Water Criteria, and identify the entity that will provide the training and its' frequency. The report should also identify any written manuals of practice to be made available to employees.